

**MIDDLESEX COUNTY CONTRIBUTORY
RETIREMENT SYSTEM
AUDIT REPORT**

JANUARY 1, 2014 - DECEMBER 31, 2018



PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

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PERAC

COMMONWEALTH OF MASSACHUSETTS | PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION

PHILIP Y. BROWN, ESQ., *Chairman*

JOHN W. PARSONS, ESQ., *Executive Director*

Auditor SUZANNE M. BUMP | KATHLEEN M. FALLON | KATE FITZPATRICK | JAMES M. MACHADO | ROBERT B. McCARTHY | JENNIFER F. SULLIVAN

November 6, 2020

The Public Employee Retirement Administration Commission (PERAC) has completed a review of the audits of the Middlesex County Retirement System (MCRS) conducted by the firm of Powers & Sullivan, LLC, Certified Public Accountants. Powers & Sullivan conducted these audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits in *Government Auditing Standards*, issued by the Comptroller General of the United States. The audits covered the period from January 1, 2014 to December 31, 2018.

We conducted an inspection of the work papers prepared by Powers & Sullivan. We determined that the audits were conducted in a competent, professional manner and the work papers demonstrated that audit tests and procedures were performed in sufficient detail to allow us to accept the final audit reports as issued.

We identified specific differences between these financial audits designed to provide an opinion on financial statements and our compliance audits performed in accordance with the accounting and management standards established by PERAC in regulation 840 CMR 25.00 and in compliance with the provisions specified in PERAC Memo #18/2019.

Accordingly, we supplemented the field work conducted in the audits by Powers & Sullivan with certain limited procedures designed to provide additional assurance that the accounting and management standards established by PERAC were adhered to and complied with. The specific objectives of our review were to determine: 1) that the Board is exercising appropriate fiduciary oversight, 2) that cash balances are accurately stated, 3) that travel and debit card expenses were properly documented and accounted for, 4) that retirement contributions are accurately deducted, 5) that retirement allowances were correctly calculated, and 6) that required member documentation is maintained.

To achieve these objectives, we inspected certain records of the Middlesex County Retirement Board in the above areas. Specifically, we reviewed the minutes of the Board meetings for compliance with fiduciary oversight, verified cash balances, and tested a sample of travel and debit card expenses for Board approvals, supporting documentation and proper accounting. We tested the payroll records of a sample of active members to confirm that the correct percentage of regular compensation is being deducted, including the additional two percent over \$30,000. We tested a sample of members who retired during our audit period to verify that their retirement allowance was calculated in accordance with the statute. We also reviewed a sample of member files for accuracy and completeness.



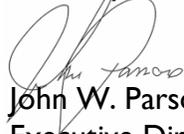
In our opinion, the financial records are being maintained and the management functions are being performed in conformity with the standards established by PERAC with the exception of those related to our supplemental work which are detailed in the finding presented in this report.

It should be noted that the financial statements included in this audit report were based on the work performed by Powers & Sullivan and the tests conducted for the periods referenced in their opinions. These audits were not performed by employees or representatives of PERAC. It should also be noted that the opinions expressed in these audit reports were based on the laws and regulations in effect at the time.

The financial statements and footnotes presented in this report were limited to the express results as of and for the years ended December 31, 2018, December 31, 2017, December 31, 2016, December 31, 2015 and December 31, 2014.

In closing, I wish to acknowledge the work of Powers & Sullivan, who conducted these examinations, PERAC examiners, Carol Poladian, Karen Casper and Junior Yanga, who conducted limited procedures to supplement the field work, and express my appreciation to the Middlesex County Retirement Board and staff for their courtesy and cooperation.

Sincerely,

A handwritten signature in black ink, appearing to read "John W. Parsons".

John W. Parsons, Esq.
Executive Director

EXPLANATION OF FINDING AND RECOMMENDATION

Board Expenses:

The Middlesex Retirement Board has a regulation stating “The Board is authorized to establish one debit card account for use by MCRS staff to facilitate arrangements for travel, lodging and related matters.”

We noted use of the debit card for items which were not directly related to Board travel but are allowable as Board expenses. These included recurring transactions for software fees, subscriptions, postage and Board meeting expenditures.

Recommendation: Pursuant to the Board’s own regulation, the debit card should only be used for travel-related items. The recurring items mentioned should be paid by check.

Board Response:

The Board’s Supplementary Travel Regulation has been subsequently amended and approved by PERAC, so as to allow for a broader use of the debit card for payment of allowable Board expenses.

PERAC Response:

We commend the Board for acting to remedy this finding in a timely manner. We note that expenses under the new Middlesex regulation must adhere to the limitations contained in 840 CMR 2.11(2).

FINAL DETERMINATION:

PERAC Audit staff will follow up in six (6) months to ensure appropriate actions have been taken regarding all findings

SUPPLEMENTARY INFORMATION
SCHEDULE OF ALLOCATION OF INVESTMENTS OWNED
(percentages by category)

AS OF DECEMBER 31, 2018		
	MARKET VALUE	PERCENTAGE OF TOTAL ASSETS
Cash	\$39,515,665	3.0%
Pooled Alternative Investment Funds	4,786,462	0.4%
Pooled Real Estate Funds	2,332,569	0.2%
PRIT Core Fund	<u>1,290,918,214</u>	<u>96.5%</u>
Grand Total	<u>\$1,337,552,910</u>	<u>100.0%</u>

For the year ending December 31, 2018, the rate of return for the investments of the Middlesex County Retirement System was -1.51%. For the five-year period ending December 31, 2018, the rate of return for the investments of the Middlesex County Retirement System averaged 6.14%. For the 34-year period ending December 31, 2018, since PERAC began evaluating the returns of the retirement systems, the rate of return on the investments of the Middlesex County Retirement System was 8.24%.

The composite rate of return for all retirement systems for the year ending December 31, 2018 was -2.25%. For the five-year period ending December 31, 2018, the composite rate of return for the investments of all retirement systems averaged 6.22%. For the 34-year period ending December 31, 2018, since PERAC began evaluating the returns of the retirement systems, the composite rate of return on the investments of all retirement systems averaged 9.00%.

SUPPLEMENTARY INFORMATION (Continued)

ADMINISTRATION OF THE SYSTEM

The System is administered by a five-person Board of Retirement consisting of the Chairman who shall be selected by the other four board members, a second member appointed by the Advisory Council, a third and fourth member who shall be elected by the members in or retired from the service of such system, and a fifth member appointed by the other four board members.

Chairman:	Thomas F. Gibson, Esq.	Term Expires:	12/31/20
Appointed Member:	Brian P. Curtin	Term Expires:	12/31/21
Elected Member:	Joseph W. Kearns	Term Expires:	12/31/22
Elected Member:	John Brown	Term Expires:	12/31/20
Appointed Member:	Robert W. Healy	Term Expires:	12/17/20

The Board members are required to meet at least once a month. The Board must keep a record of all of its proceedings. The Board must annually submit to the appropriate authority an estimate of the expenses of administration and cost of operation of the system. The board must annually file a financial statement of condition for the system with the Executive Director of PERAC.

The investment of the system's funds is the responsibility of the Board. All retirement allowances must be approved by the Retirement Board. The PERAC Actuary performs verification prior to payment, unless the system has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the System must be approved by a majority vote of the Board. Payments shall be made only upon vouchers signed by two persons designated by the Board.

Retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts. Fidelity insurance is the only required policy coverage under Ch. 32 §21 and §23 as well as 840 CMR 17.01. The policy is designed to cover specific intentional acts such as theft, fraud or embezzlement and also specify who commits such acts, most commonly employees of the system. This coverage reimburses the system for the losses it suffers as a result of its employees' actions. It does not insure the employees for their illegal acts. Statutorily required coverage is provided by the current fidelity insurance policy to a limit of \$1,000,000 with a \$10,000 deductible issued through National Union Fire Insurance Company. The system also has Fiduciary coverage to a limit of \$10,000,000 under a blanket policy issued through Markel American Insurance Company.

BOARD REGULATIONS

The Middlesex County Retirement System has adopted Supplemental Regulations which are available on the PERAC website at <https://www.mass.gov/middlesex-county-retirement-board-regulations>.

SUPPLEMENTARY INFORMATION (Continued)

ACTUARIAL VALUATION AND ASSUMPTIONS

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

The actuarial liability for active members was	\$1,329,121,646
The actuarial liability for inactive members was	50,868,615
The actuarial liability for retired members was	<u>1,417,545,709</u>
The total actuarial liability was	\$2,797,535,970
System assets as of that date were (actuarial value)	<u>1,339,085,622</u>
The unfunded actuarial liability was	<u>\$1,458,450,348</u>
The ratio of system's assets to total actuarial liability was	47.9%
As of that date the total covered employee payroll was	\$451,777,105

The normal cost for employees on that date was 10.09% of payroll
 The normal cost for the employer including administrative expense was 4.99% of payroll

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

Investment Return: 7.50% per annum
 Rate of Salary Increase: Varies by group and service

SCHEDULE OF FUNDING PROGRESS AS OF JANUARY 1, 2018

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (b)	Unfunded AAL (UAAL) (b-a)	Funded Ratio (a/b)	Covered Payroll (c)	UAAL as a % of Cov. Payroll ((b-a)/c)
1/1/2018	\$1,339,085,622	\$2,797,535,970	\$1,458,450,348	47.9%	\$471,115,185	309.6%
1/1/2016	\$1,141,122,663	\$2,492,161,766	\$1,351,039,103	45.8%	\$439,644,322	307.3%
1/1/2014	\$967,146,018	\$2,195,732,452	\$1,228,586,434	44.0%	\$415,752,810	295.5%
1/1/2012	\$862,323,395	\$1,974,144,909	\$1,111,821,514	43.7%	\$393,100,995	282.8%
1/1/2010	\$819,987,914	\$1,743,581,707	\$923,593,793	47.0%	\$384,933,571	239.9%

* Beginning with 1/1/2016 valuation, we used total payroll as the covered payroll.

SUPPLEMENTARY INFORMATION (Continued)

MEMBERSHIP EXHIBIT

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Retirement in Past Years										
Superannuation	186	245	241	230	223	295	289	268	294	327
Ordinary Disability	2	3	3	2	3	1	0	1	2	1
Accidental Disability	12	6	12	7	3	12	6	8	6	5
Total Retirements	200	254	256	239	229	308	295	277	302	333
Total Retirees, Beneficiaries and Survivors	4,828	4,906	4,986	5,007	5,036	5,267	5,288	5,394	5,497	5,677
Total Active Members	10,285	10,240	10,413	10,413	10,531	10,224	10,306	9,997	9,283	9,142
Pension Payments										
Superannuation	\$58,987,084	\$62,342,806	\$65,774,890	\$69,897,633	\$73,681,311	\$75,978,373	\$86,762,912	\$90,372,428	\$94,423,315	\$99,461,542
Survivor/Beneficiary Payments	3,643,807	3,826,054	4,649,886	4,818,894	3,913,983	4,154,980	2,020,209	5,023,927	4,946,105	5,119,154
Ordinary Disability	1,258,246	1,277,373	1,186,655	1,212,320	1,165,873	1,377,095	1,381,443	1,072,875	1,110,977	1,130,516
Accidental Disability	10,867,227	11,118,427	11,481,590	11,860,911	12,081,011	13,934,194	14,790,305	12,858,584	13,247,123	13,409,632
Other	<u>15,015,374</u>	<u>6,855,248</u>	<u>6,678,717</u>	<u>10,725,434</u>	<u>12,092,856</u>	<u>10,116,822</u>	<u>10,251,686</u>	<u>14,857,779</u>	<u>13,941,224</u>	<u>16,220,421</u>
Total Payments for Year	<u>\$89,771,738</u>	<u>\$85,419,907</u>	<u>\$89,771,738</u>	<u>\$98,515,192</u>	<u>\$102,935,035</u>	<u>\$105,561,463</u>	<u>\$115,206,556</u>	<u>\$124,185,592</u>	<u>\$127,668,745</u>	<u>\$135,341,266</u>

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2018

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31,2018

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Financial Section



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

Report on the Financial Statements

We have audited the accompanying financial statements of Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2018, and the related notes to the financial statements, which collectively comprise the Middlesex County Retirement System's financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Middlesex County Retirement System as of December 31, 2018, and the results of its operations and changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis; the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Returns be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated July 18, 2019, on our consideration of the Middlesex County Retirement System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Middlesex County Retirement System's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System, the Public Employee Retirement Administration Commission and all member units and is not intended to be and should not be used by anyone other than these specified parties.



July 18, 2019

Management's Discussion and Analysis

As management of the Middlesex County Retirement System, we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2018. The System complies with financial reporting requirements issued by the Governmental Accounting Standards Board (GASB).

The GASB is the authoritative standard setting body that provides guidance on how to prepare financial statements in conformity with generally accepted accounting principles (GAAP). Users of these financial statements rely on the GASB to establish consistent reporting standards for all governments in the United States. This consistent application is the only way users can assess the financial condition of a public retirement system compared to others.

Financial Highlights

- The System's assets exceeded its liabilities at the close of the most recent year by \$1.4 billion (net position).
- The System's net position decreased by \$28.3 million for the year ended December 31, 2018.
- Total investment loss was \$24.0 million; investment expenses were \$7.1 million; and net investment loss was \$31.1 million.
- Total contributions were \$176.2 million, primarily consisting of \$120.6 million from employers, \$46.0 from members, \$5.3 million in transfers from other systems and \$4.3 million in other contributions.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$170.1 million.
- Depreciation, administrative and building expenses were \$3.3 million.
- The Total Pension Liability is \$2.9 billion as of December 31, 2018, while the Net Pension Liability is \$1.6 billion.
- The Plan fiduciary net position as a percentage of the total pension liability is 46.4%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the System fiduciary financial statements. These fiduciary financial statements comprise of four components: 1) management's discussion and analysis, 2) fiduciary financial statements, 3) notes to the financial statements and 4) required supplementary information.

Fiduciary Financial Statements

The *statement of net position* presents information on all assets and deferred outflows less deferred inflows and liabilities with the difference reported as *net position*. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position is improving or deteriorating.

The *statement of changes in fiduciary net position* presents information showing how the system's net position changed during the most recent year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, *regardless of the timing of related cash flows*. Thus, additions and deductions are reported in this statement for some items that will only result in cash flows in future periods.

Notes to the financial statements

The notes provide additional information that is essential to a full understanding of the data provided in the fiduciary financial statements.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Returns be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context.

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the System’s financial position. The System’s assets exceeded liabilities by \$1.4 billion at the close of 2018.

The assets accumulated are held to provide pension benefits for qualified retirees along with active and inactive employees of the member units. At year-end the system’s net position include investments of \$1.3 billion, cash of \$39.5 million and current accounts receivable of \$7.7 million. The system also had capital assets, net of accumulated depreciation of \$5.0 million at year-end primarily consisting of land, an office building, and building improvements.

In 2018 the System’s contributions were \$176.2 million while deductions were \$173.4 million which resulted in a current surplus of \$2.8 million. In 2017 the System’s contributions were \$170.0 million while deductions were \$163.4 million which resulted in a prior year surplus of \$6.6 million. Therefore, for these two years the System was able to sustain operations independent of investment income.

The primary change in net position over the prior year relates to each year’s investment performance. Net investment loss was \$31.1 million in 2018 and net investment income was \$189.3 million in 2017. The annual money weighted rate of return was -2.52% and 17.25% in 2018 and 2017 respectively. The system’s investment policy is designed to achieve a long-term rate of return of 7.50% and fluctuation in annual investment returns is expected.

The following tables present summarized financial information for the past two years.

	2018	2017
Assets:		
Cash.....	\$ 39,515,665	\$ 58,763,167
Investments.....	1,298,037,245	1,305,346,026
Receivables.....	7,678,260	9,056,556
Capital assets, net of accumulated depreciation....	5,041,775	5,353,968
Total assets.....	1,350,272,945	1,378,519,717
Liabilities:		
Accounts payable.....	141,480	150,658
Other.....	91,700	17,840
Total liabilities.....	233,180	168,498
Net Position Restricted for Pensions.....	\$ 1,350,039,765	1,378,351,219

	<u>2018</u>	<u>2017</u>
Additions:		
Contributions:		
Member contributions.....	\$ 45,984,957	\$ 44,177,815
Employer contributions.....	120,683,218	115,462,035
Other contributions.....	<u>9,513,101</u>	<u>10,320,943</u>
Total contributions.....	<u>176,181,276</u>	<u>169,960,793</u>
Net investment income (loss):		
Total investment income (loss).....	(24,002,304)	195,709,657
Less, investment expenses.....	<u>(7,072,407)</u>	<u>(6,366,083)</u>
Net investment income (loss).....	<u>(31,074,711)</u>	<u>189,343,574</u>
Total additions.....	<u>145,106,565</u>	<u>359,304,367</u>
Deductions:		
Administration.....	2,645,568	2,619,464
Retirement benefits, refunds and transfers.....	170,144,282	160,139,193
Building operations and maintenance.....	309,357	306,177
Depreciation.....	<u>318,812</u>	<u>308,508</u>
Total deductions.....	<u>173,418,019</u>	<u>163,373,342</u>
Net increase (decrease) in fiduciary net position....	(28,311,454)	195,931,025
Fiduciary net position at beginning of year.....	<u>1,378,351,219</u>	<u>1,182,420,194</u>
Fiduciary net position at end of year.....	<u>\$ 1,350,039,765</u>	<u>\$ 1,378,351,219</u>

Requests for Information

This financial report is designed to provide a general overview of the System's finances for all those with an interest in the System's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the System's Chief Administrative Officer, 25 Linnell Circle, Billerica, Massachusetts 01865.

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2018

Assets	
Cash and cash equivalents.....	\$ 39,515,665
Investments:	
Investments in Pension Reserve Investment Trust...	1,290,918,214
Other Investments.....	<u>7,119,031</u>
Total investments.....	<u>1,298,037,245</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	2,293,685
Member contributions.....	20,901
Employer pension appropriation.....	56,991
Reimbursements from other systems.....	3,896,021
Member make-up payments and redeposits.....	172,360
Other accounts receivable.....	<u>1,238,302</u>
Total Receivables.....	<u>7,678,260</u>
Capital assets, net of accumulated depreciation.....	<u>5,041,775</u>
Total Assets.....	<u>1,350,272,945</u>
Liabilities	
Accounts payable.....	141,480
Other liabilities.....	<u>91,700</u>
Total Liabilities.....	<u>233,180</u>
Net Position Restricted for Pensions.....	\$ <u>1,350,039,765</u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2018

Additions:	
Contributions:	
Employer pension appropriation.....	\$ 120,614,676
Member contributions.....	45,984,957
Transfers from other systems.....	5,276,442
3(8)(c) contributions from other systems.....	3,539,493
Workers' compensation settlements.....	68,542
Members' makeup payments and redeposits.....	605,792
Interest not refunded.....	<u>91,374</u>
 Total contributions.....	 <u>176,181,276</u>
Net investment income:	
Investment income (loss).....	(24,002,304)
 Less: investment expense.....	 <u>(7,072,407)</u>
Net investment income (loss).....	<u>(31,074,711)</u>
 Total additions.....	 <u>145,106,565</u>
Deductions:	
Administration.....	2,645,568
Building operations and maintenance.....	309,357
Retirement benefits and refunds.....	151,591,210
Transfers to other systems.....	5,934,117
3(8)(c) transfer to other systems.....	12,618,955
Depreciation.....	<u>318,812</u>
 Total deductions.....	 <u>173,418,019</u>
 Net increase (decrease) in fiduciary net position.....	 <u>(28,311,454)</u>
Fiduciary net position at beginning of year.....	<u>1,378,351,219</u>
Fiduciary net position at end of year.....	\$ <u><u>1,350,039,765</u></u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week and who are paid annual compensation of no less than \$5,000. As of January 1, 2019, the System had 71 participating employers.

The System is a member of the Massachusetts Contributory Retirement System and is governed by Chapter 32 of the Massachusetts General Laws. Membership in the Plan is mandatory immediately upon the commencement of employment for all permanent, full-time employees.

Massachusetts contributory retirement system benefits are, with certain exceptions, uniform from system to system. The System provides for retirement allowance benefits up to a maximum of 80% of a member's highest three-year average annual rate of regular compensation for those hired prior to April 2, 2012 and the highest five-year average for members hired after that date. Benefit payments are based upon a member's age, length of creditable service, level of compensation, and group classification.

Members become vested after ten years of creditable service. A superannuation retirement allowance may be received upon the completion of 20 years of service or upon reaching the age of 55 with 10 years of service for those hired prior to April 2, 2012. For those hired on or after April 2, 2012, a superannuation allowance may be received upon reaching the age of 60 with 10 years of service. Normal retirement for most employees occurs at age 65 for those hired prior to April 2, 2012 and at age 67 for those hired after April 2, 2012 (except for certain hazardous duty and public safety positions, whose normal retirement is at age 55).

A retirement allowance consists of two parts: an annuity and a pension. A member's accumulated total deductions and the interest they generate constitute the annuity. The differential between the total retirement benefit and the annuity is the pension.

Active members contribute between 5% and 11% of their gross regular compensation. The percentage rate is keyed to the date upon which an employee's membership commences. These deductions are deposited in the Annuity Savings Fund and earn interest at a rate determined by the Public Employee Retirement Administration Commission's (PERAC) actuary. When a member's retirement becomes effective, his/her deductions and related interest are transferred to the Annuity Reserve Fund. Any cost-of-living adjustments granted between 1981 and 1997 and any increase in other benefits imposed by the Commonwealth of Massachusetts' state law during those years are borne by the Commonwealth and are deposited into the Pension Fund. Cost-of-living adjustments granted after 1997 must be approved by the System and all costs are borne by the System.

The pension portion of any retirement benefit is paid from the Pension Fund. The governmental unit employing the member must annually appropriate and contribute the amount of current-year pension assessment.

Administrative expenses are paid from investment income.

Members who become permanently and totally disabled for further duty may be eligible to receive a disability retirement allowance. The amount of benefits to be received in such cases is dependent on several factors, including whether or not the disability is work related, the member's age, years of creditable service, level of compensation, veterans' status and group classification.

Survivor benefits are extended to eligible beneficiaries of members whose death occurs prior to or following retirement.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements of the Middlesex County Retirement System have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is the recognized standard-setting body for establishing governmental accounting and financial reporting principles.

MCRS is a special-purpose government engaged only in fiduciary activities. Accordingly, the financial statements are reported using the flow of economic resources measurement focus and use the accrual basis of accounting. Under this method, additions are recorded when earned and deductions are recorded when the liabilities are incurred.

Cash and Investments

Cash and cash equivalents are considered to be cash on hand, demand deposits and short-term investments with an original maturity of three months or less from the date of acquisition. Investments are carried at fair value. The fair values were determined by the closing price for those securities traded on national stock exchanges and at the average bid-and-asked quotation for those securities traded in the over-the-counter market. The fair value of private equities are based on management's valuation of estimates and assumptions from information and representations provided by the respective general partners, in the absence of readily ascertainable market values. Real estate assets are reported at fair value utilizing an income approach to valuation along with independent appraisals and estimates by management.

Fair Value Measurements

The System reports required types of financial instruments in accordance with the fair value standards. These standards require an entity to maximize the use of observable inputs (such as quoted prices in active markets) and minimize the use of unobservable inputs (such as appraisals or valuation techniques) to determine fair value. Fair value standards also require the government to classify these financial instruments into a three-level hierarchy, based on the priority of inputs to the valuation technique or in accordance with net asset value practical expedient rules, which allow for either Level 2 or Level 3 depending on lock up and notice periods associated with the underlying funds.

Instruments measured and reported at fair value are classified and disclosed in one of the following categories:

Level 1 – Quoted prices are available in active markets for identical instruments as of the reporting date. Instruments, which are generally included in this category, include actively traded equity and debt securities, U.S. government obligations, and mutual funds with quoted market prices in active markets.

Level 2 – Pricing inputs are other than quoted in active markets, which are either directly or indirectly observable as of the reporting date, and fair value is determined through the use of models or other valuation methodologies. Certain fixed income securities, primarily corporate bonds, are classified as Level 2 because fair values are estimated using pricing models, matrix pricing, or discounted cash flows.

Level 3 – Pricing inputs are unobservable for the instrument and include situations where there is little, if any, market activity for the instrument. The inputs into the determination of fair value require significant management judgment or estimation.

In some instances the inputs used to measure fair value may fall into different levels of the fair value hierarchy and is based on the lowest level of input that is significant to the fair value measurement.

Market price is affected by a number of factors, including the type of instrument and the characteristics specific to the instrument. Instruments with readily available active quoted prices generally will have a higher degree of market price observability and a lesser degree of judgment used in measuring fair value. It is reasonably possible that change in values of these instruments will occur in the near term and that such changes could materially affect amounts reported in these financial statements. For more information on the fair value of the System's financial instruments, see Note 5 – Cash and Investments.

Accounts Receivable

Accounts receivable consist of member deductions, pension fund appropriations, and other miscellaneous reimbursements. These receivables are considered 100% collectible and therefore do not report an allowance for uncollectibles.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of fiduciary net position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents a consumption of fiduciary net position that applies to a future period(s) and so will not be recognized as an outflow of resources (deduction) until then. The MCRS did not have any items that qualify for reporting in this category.

In addition to liabilities, the statement of fiduciary net position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources*, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (addition) until that time. The MCRS did not have any items that qualify for reporting in this category.

NOTE 3 – PLAN ADMINISTRATION

The System is administered by a five-person Board of Retirement consisting of a first member, who shall serve as Chairman/Treasurer, who shall be appointed by the other four members, a second member elected by the Advisory Council consisting of representatives from the member units, a third and fourth member who shall be elected by the members in or retired from the service of such system, and a fifth member who shall be chosen by the other four members.

Chairman	Thomas F. Gibson	Term Expires:	12/31/2020
Advisory Council Member	Brian P. Curtin	Term Expires:	12/31/2021
Elected Member	John Brown	Term Expires:	12/31/2020
Elected Member	Joseph W. Keams	Term Expires:	12/31/2019
Appointed Member	Robert Healy	Term Expires:	12/17/2020

Board members are required to meet at least once a month. The Board must keep a record of all of its proceedings. The Board must annually submit to the appropriate authority an estimate of the expenses of administration and cost of operation of the System. The Board must annually file a financial statement of condition for the System with the Executive Director of PERAC.

The investment of the System's funds is the responsibility of the Board. All retirement allowances must be

approved by the Retirement Board. The PERAC Actuary performs verification prior to payment, unless the System has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the System must be approved by a majority vote of the Board. Payments shall be made only upon vouchers signed by three persons designated by the Board.

The following retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts as follows:

Treasurer-Custodian:) \$10,000,000 Fiduciary
 Ex-Officio Member:) RLI Insurance Company
 Elected Members:)
 Appointed Members:) \$1,000,000 Fidelity
 Staff Employees:) National Union Fire Insurance

NOTE 4 – OFFICE BUILDING

The MCRS owns an office building that was purchased as an investment and for the administrative offices of the System. The building is a two story, 1986-built office building consisting of 62,307 square feet of net rentable area. The property is situated on a 4.23 acre site in Billerica, Middlesex County, Massachusetts

NOTE 5 – CASH AND INVESTMENTS

Custodial Credit Risk - Deposits

At December 31, 2018, the carrying amount of the System's deposits totaled \$36,255,357, and the bank balance totaled \$38,256,473, all of which was covered by Federal Depository Insurance.

Investments

The System's investments are as follows:

<u>Investment Type</u>	<u>December 31, 2018</u>
PRIT Pooled Funds.....	\$ 1,290,918,214
Money Market Mutual Funds.....	3,260,308
Pooled Alternative Investments...	4,786,461
Pooled Real Estate Funds.....	2,332,569
Total Investments.....	<u>\$ 1,301,297,552</u>

Approximately 99% of the Retirement System's investments are in Pension Reserve Investment Trust (PRIT). This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board. The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The Administration does not have the ability to control any of the investment decisions relative to its funds in PRIT.

Approximately 0.5% of the System's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 0.3% of the System's funds are invested in money market mutual funds. The market values of assets in those funds are valued using prices quoted in active markets for those securities.

The Administration's annual money-weighted rate of return on pension plan investments was -2.52%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Value of Investments

The retiree pension defined benefit plan holds significant amounts of investments that are measured at fair value on a recurring basis. Because investing is a key part of the plan's activities, the plan shows greater disaggregation in its disclosures. The plan chooses a tabular format for disclosing the levels within the fair value hierarchy.

The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles.

The System has the following recurring fair value measurements as of December 31, 2018:

Investment Type	12/31/2018	Fair Value Measurements Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level.....				
<i>Other Investments</i>				
Money Market Mutual Funds.....	\$ 3,260,308	\$ 3,260,308	\$ -	\$ -
Pooled Alternative Investments.....	4,786,462	-	-	4,786,462
Pooled Real Estate Funds.....	2,332,569	-	-	2,332,569
Total Investments by fair value level.....	10,379,339	\$ 3,260,308	\$ -	\$ 7,119,031
Investments measured at the net asset value (NAV).....				
PRIT Investments.....	1,290,918,214			
Total Investments.....	\$ 1,301,297,553			

Money Market Mutual Funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled Alternative Investments and Pooled Real Estate Funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method. This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board (PRIM). The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The System does not have the ability to control any of the investment decisions relative to its funds in PRIT.

NOTE 6 – CAPITAL ASSETS

Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements....	40
Pick-up truck.....	5
PTG Software.....	5

Capital asset activity for the year ended December 31, 2018, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building Improvements.....	1,092,873	6,619	-	1,099,492
Vehicles.....	50,516	-	-	50,516
PTG Software.....	729,570	-	-	729,570
Total capital assets being depreciated.....	7,290,095	6,619	-	7,296,714
<u>Less accumulated depreciation for:</u>				
Buildings.....	(2,035,782)	(135,428)	-	(2,171,210)
Building Improvements.....	(407,485)	(27,166)	-	(434,651)
Vehicles.....	(19,603)	(10,304)	-	(29,907)
PTG Software.....	(145,914)	(145,914)	-	(291,828)
Total accumulated depreciation.....	(2,608,784)	(318,812)	-	(2,927,596)
Total capital assets being depreciated, net.....	4,681,311	(312,193)	-	4,369,118
Total capital assets, net.....	\$ 5,353,968	\$ (312,193)	\$ -	\$ 5,041,775

NOTE 7 – MEMBERSHIP

The following table represents the System's membership at December 31, 2018:

	<u>2018</u>
Active members.....	9,142
Inactive members.....	3,486
Disabled members.....	430
Retirees and beneficiaries currently receiving benefits.....	<u>5,247</u>
Total.....	<u>18,305</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2018, were as follows:

Total pension liability.....	\$ 2,909,506,224
The pension plan's fiduciary net position.....	<u>1,350,039,765</u>
The net pension liability.....	<u>\$ 1,559,466,459</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	46.40%

The total pension liability was determined by an actuarial valuation as of January 1, 2018, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2018:

Valuation date.....	January 1, 2018
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.5% for fiscal 2018 through fiscal 2024, 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, 2018, 1 year remaining for 2002 ERI liability, 2 years remaining for 2003 ERI liability, 4 years remaining for 2010 ERI liability, and 17 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.
Inflation rate.....	3.25% (previously 3.5%)

Projected salary increases.....	Varies by length of service with ultimate rates of 4.00% for Group 1, 4.25% for Group 2 and 4.50% for Group 4
Cost of living adjustments.....	3.0% of the first \$14,000 of retirement income.
Rates of retirement.....	Varies based upon age for general employees, police and fire employees.
Rates of disability.....	For general employees, it was assumed that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).
Mortality Rates:	
Pre-Retirement.....	The RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017.
Healthy Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2017.
Disabled Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year and projected generationally with Scale MP-2017.
Investment rate of return/Discount rate.....	7.50%, net of pension plan investment expense, including inflation previously 7.75%

Investment policy: The pension plan's policy in regard to the allocation of invested assets is established by PRIT. Plan assets are managed on a total return basis with a long-term objective of achieving a fully funded status for the benefits provided through the pension plan.

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 January 1, 2018, are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return	Long-Term Expected Asset Allocation
Domestic equity.....	7.62%	17.00%
International developed markets equity.....	7.80%	14.90%
International emerging markets equity.....	9.31%	6.00%
Core fixed income.....	4.00%	13.00%
Value-added fixed income.....	7.58%	8.10%
Private equity.....	11.15%	12.10%
Real estate.....	6.59%	9.40%
Timberland.....	7.00%	4.10%
Hedge funds|PCS.....	6.83%	14.20%
Liquidating portfolios.....	0.00%	0.30%
Overlay.....	0.00%	0.90%
		100.00%

Discount rate: The discount rate used to measure the total pension liability was 7.50%. 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 rate. 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 position liability to changes in the discount rate. The following presents the net position liability, calculated using the discount rate of 7.50%, as well as what the net position liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.50%) or 1-percentage-point higher (8.50%) than the current rate:

	1% Decrease (6.50%)	Discount (7.50%)	1% Increase (8.50%)
Middlesex County Retirement System's net pension liability as of December 31, 2018.....	\$ 1,891,702,743	\$ 1,559,466,459	\$ 1,279,342,565

Contributions: Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The pension fund appropriations are allocated amongst employers based on the actuarial valuation.

NOTE 9 – DISPUTE WITH THE COMMONWEALTH AND STATE EMPLOYEES RETIREMENT SYSTEM

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County be transferred to the Commonwealth. Therefore, the MCERS was required to transfer the Annuity Savings Fund Balances of these transferred County employees to the State Employees Retirement System (SERS). This transfer, totaling approximately \$18 million, was made during calendar year 1998.

In December of 1999, the State Legislature enacted Massachusetts General Law, Chapter 34B (Abolition of County Government). This legislation, among other things, defines the components of determining the overall surplus or deficit of an abolished County upon transfer to the Commonwealth and how regional retirement systems will be affected. Sections 8 and 18 addressed how the abolished County's unfunded liabilities in regional retirement systems will be paid for. The MCERS believes, as a result of the abolishment of Middlesex County, that the Commonwealth of Massachusetts owed them \$9,501,680 for the Unfunded Liability for retirees of the former Middlesex County.

The Commonwealth and SERS did not agree with the assertion that the MCERS was owed \$9,501,680. As a result, the MCERS acted to stop 3(8)(c) reimbursements to the State Employees Retirement System and correspondingly the State System began to intercept all COLA reimbursements which were due the MCERS. In 2012 the MCERS reinstated payments for 3(8)(c) reimbursements to the SERS. The SERS and MCERS are finalizing the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld; however, a final payment to resolve the issue has yet to be made.

The net amount of these transactions is not considered significant and has not been reported in these financial statements.

NOTE 10 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

During 2018, the following GASB pronouncements were implemented:

- GASB Statement #75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions*. The basic financial statements, related notes and required supplementary information were updated to be in compliance with this pronouncement.
- GASB Statement #81, *Irrevocable Split-Interest Agreements*. This pronouncement did not impact the basic financial statements.
- GASB Statement #85, *Omnibus 2017*. This pronouncement did not impact the basic financial statements.
- GASB Statement #86, *Certain Debt Extinguishment Issues*. This pronouncement did not impact the basic financial statements.

The following GASB pronouncements will be implemented in the future:

- The GASB issued Statement #83, *Certain Asset Retirement Obligations*, which is required to be implemented in 2019.
- The GASB issued Statement #84, *Fiduciary Activities*, which is required to be implemented in 2019.
- The GASB issued Statement #87, *Leases*, which is required to be implemented in 2021.
- The GASB issued Statement #88, *Certain Disclosures Related to Debt, including Direct Borrowings and Direct Placements*, which is required to be implemented in 2019.
- The GASB issued Statement #89, *Accounting for Interest Cost Incurred before the End of a Construction Period*, which is required to be implemented in 2021.
- The GASB issued Statement #90, *Majority Equity Interests – an amendment of GASB Statements #14 and #61*, which is required to be implemented in 2020.

Management is currently assessing the impact the implementation of these pronouncements will have on the basic financial statements.

NOTE 11 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through July 18, 2019, which is the date the financial statements were available to be issued.

Required Supplementary Information

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
AND RELATED RATIOS**

	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018
Total pension liability:					
Service cost.....	\$ 52,132,389	\$ 54,217,685	\$ 56,386,382	\$ 60,585,598	\$ 64,815,910
Interest.....	172,094,226	179,703,272	187,359,946	200,298,121	208,614,148
Changes in benefit terms.....	-	-	-	-	-
Differences between expected and actual experience.....	-	-	7,976,453	(9,059,393)	-
Changes in assumptions.....	-	-	96,500,754	97,195,824	-
Benefit payments.....	<u>(125,082,678)</u>	<u>(134,295,504)</u>	<u>(143,428,636)</u>	<u>(150,780,931)</u>	<u>(161,259,804)</u>
Net change in total pension liability.....	99,143,937	99,625,453	204,794,909	198,239,219	111,970,254
Total pension liability - beginning.....	<u>2,195,732,452</u>	<u>2,294,876,389</u>	<u>2,394,501,842</u>	<u>2,599,296,751</u>	<u>2,797,535,970</u>
Total pension liability - ending (a).....	<u>\$ 2,294,876,389</u>	<u>\$ 2,394,501,842</u>	<u>\$ 2,599,296,751</u>	<u>\$ 2,797,535,970</u>	<u>\$ 2,909,506,224</u>
Plan fiduciary net position:					
Employer pension appropriation.....	\$ 93,368,685	\$ 99,792,641	\$ 107,032,211	\$ 115,377,205	\$ 120,614,676
Member contributions.....	39,048,869	40,340,741	42,015,296	44,177,815	45,984,957
Other contributions.....	6,405,881	8,668,378	12,337,414	10,405,773	9,581,643
Net investment income (loss).....	74,904,315	7,732,128	74,917,546	189,343,574	(31,074,711)
Administrative expenses.....	(2,996,390)	(2,824,803)	(3,062,521)	(2,619,464)	(2,645,568)
Building operations and maintenance.....	(381,899)	(302,771)	(235,667)	(306,177)	(309,357)
Retirement benefits and refunds.....	(125,082,678)	(134,295,504)	(143,428,636)	(150,780,931)	(161,259,804)
Other retirement deductions.....	(5,556,930)	(8,025,993)	(11,475,752)	(9,358,262)	(8,884,478)
Depreciation.....	<u>(162,594)</u>	<u>(162,594)</u>	<u>(162,594)</u>	<u>(308,508)</u>	<u>(318,812)</u>
Net increase (decrease) in fiduciary net position.....	79,547,259	10,922,223	77,937,297	195,931,025	(28,311,454)
Fiduciary net position - beginning of year.....	<u>1,014,013,415</u>	<u>1,093,560,674</u>	<u>1,104,482,897</u>	<u>1,182,420,194</u>	<u>1,378,351,219</u>
Fiduciary net position - end of year (b).....	<u>\$ 1,093,560,674</u>	<u>\$ 1,104,482,897</u>	<u>\$ 1,182,420,194</u>	<u>\$ 1,378,351,219</u>	<u>\$ 1,350,039,765</u>
Net pension liability - ending (a)-(b).....	<u>\$ 1,201,315,715</u>	<u>\$ 1,290,018,945</u>	<u>\$ 1,416,876,557</u>	<u>\$ 1,419,184,751</u>	<u>\$ 1,559,466,459</u>
Plan fiduciary net position as a percentage of the total pension liability.....	47.65%	46.13%	45.49%	49.27%	46.40%
Covered payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322	\$ 451,777,105	\$ 471,115,185
Net pension liability as a percentage of covered payroll.....	288.95%	298.35%	322.28%	314.13%	331.02%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

SCHEDULE OF CONTRIBUTIONS

	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018
Actuarially determined contribution.....	\$ 92,826,743	\$ 98,792,642	\$ 105,246,797	\$ 112,017,087	\$ 119,298,291
Contributions in relation to the actuarially determined contribution.....	<u>(93,400,946)</u>	<u>(99,820,481)</u>	<u>(107,067,707)</u>	<u>(115,426,815)</u>	<u>(120,614,676)</u>
Contribution deficiency (excess).....	\$ <u>(574,203)</u>	\$ <u>(1,027,839)</u>	\$ <u>(1,820,910)</u>	\$ <u>(3,409,728)</u>	\$ <u>(1,316,385)</u>
Covered payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322	\$ 451,777,105	\$ 471,115,185
Contributions as a percentage of covered payroll.....	22.47%	23.09%	24.35%	25.55%	25.60%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

SCHEDULE OF INVESTMENT RETURNS

<u>Year</u>	<u>Annual money-weighted rate of return, net of investment expense</u>
December 31, 2018.....	-2.52%
December 31, 2017.....	17.25%
December 31, 2016.....	7.35%
December 31, 2015.....	0.61%
December 31, 2014.....	7.54%

Note: this schedule is intended to present information for 10 years. Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

NOTE A – CHANGES IN THE NET PENSION LIABILITY AND RELATED RATIOS

The Schedule of Changes in the Net Pension Liability and Related Ratios includes the detailed changes in the system's total pension liability, changes in the system's net position, and the ending net pension liability. It also demonstrates the plan's net position as a percentage of the total pension liability and the net pension liability as a percentage of covered payroll.

NOTE B – CONTRIBUTIONS

Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The total appropriations are payable on July 1 and January 1. Employers may choose to pay the entire appropriation in July at a discounted rate. Accordingly, actual employer contributions may be less than the "total appropriation". The pension fund appropriations are allocated amongst employers based on the actuarial valuation results. In addition, an employer may contribute more than the amount required.

NOTE C – MONEY WEIGHTED RATE OF RETURN

The money weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. A money weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested. Inputs to the money weighted rate of return calculation are determined monthly.

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONSChanges in Assumptions

The following assumption changes were reflected in the January 1, 2018 actuarial valuation:

- The mortality tables for healthy participants were changed from the RP-2000 Employee and Healthy Annuitant Mortality Tables projected generationally using Scale BB2D from 2009 to the RP-2014 Blue Collar Employee and Healthy Annuitant Mortality Tables projected generationally using Scale MP-2017.
- The mortality tables for disabled participants were changed from the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale BB2D from 2015 to the RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward 1 year projected generationally using Scale MP-2017.
- The long-term salary increase assumption was lowered by 0.25%, to 4.00% for Group 1 participants, 4.25% for Group 2 participants, and 4.50% for Group 4 participants.
- The investment rate of return assumption was reduced from 7.75% to 7.50%.
- The inflation rate was reduced to 3.25% from the previous rate of 3.50%.

Changes in Plan Provisions

None.

Audit of Specific Elements, Accounts and Items of Financial Statements

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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

We have audited the accompanying schedule of employer allocations of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2018, and the related notes. We have also audited the total for all entities of the rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total pension expense and contributions included in the accompanying schedule of pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2018, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and total for all rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total pension expense and contributions for the total of all participating entities for the Middlesex County Retirement System as of and for the year ended December 31, 2018, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the Middlesex County Retirement System as of and for the year ended December 31, 2018, and our report thereon, dated July 18, 2019, expressed an unmodified opinion on those financial statements.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System management, the Middlesex County Retirement System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.



July 18, 2019

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2018

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	53,545,751	3.433594%
Town of Ashby.....	2,175,378	0.139495%
Town of Ashland.....	36,199,958	2.321304%
Town of Ayer.....	20,317,285	1.302836%
Town of Bedford.....	55,208,123	3.540193%
Town of Billerica.....	150,770,372	9.868074%
Town of Boxborough.....	11,288,225	0.722441%
Town of Burlington.....	127,441,167	8.172101%
Town of Carlisle.....	11,157,139	0.715446%
Town of Chelmsford.....	110,995,199	7.117511%
Town of Dracut.....	65,601,775	4.206881%
Town of Dunstable.....	2,958,745	0.189728%
Town of Groton.....	23,290,888	1.493504%
Town of Holliston.....	27,349,059	1.753745%
Town of Hopkinton.....	25,369,330	1.626795%
Town of Hudson.....	69,719,052	4.470699%
Town of Lincoln.....	27,722,484	1.777690%
Town of Littleton.....	25,332,249	1.624418%
Town of North Reading.....	52,331,338	3.355721%
Town of Pepperell.....	17,963,081	1.151232%
Town of Sherborn.....	11,725,506	0.751892%
Town of Shirley.....	9,113,056	0.584370%
Town of Stow.....	11,645,337	0.746751%
Town of Sudbury.....	63,931,576	4.095680%
Town of Tewksbury.....	104,461,551	6.898544%
Town of Townsend.....	9,256,011	0.593537%
Town of Tyngsborough.....	23,277,997	1.492890%
Town of Wayland.....	59,255,947	3.799758%
Town of Westford.....	59,376,424	3.807483%
Town of Weston.....	66,869,588	4.287979%
Town of Wilmington.....	90,145,064	5.780507%
Acton-Boxborough Regional School District.....	29,967,174	1.920989%
Acton Water Supply.....	3,740,627	0.238666%
Bedford Housing Authority.....	341,846	0.021908%
Billerica Housing Authority.....	1,441,037	0.092408%
Chelmsford Housing Authority.....	2,441,133	0.156536%
Chelmsford Water District.....	708,793	0.045451%
Dracut Housing Authority.....	2,173,260	0.139359%
Dracut Water Supply.....	3,288,228	0.210856%
East Chelmsford Water District.....	381,924	0.024491%
East Middlesex Mosquito Control.....	662,694	0.042485%
Greater Lowell Regional Vocational Technical School District.....	16,800,249	1.077307%
Groton-Dunstable Regional School District.....	12,305,499	0.789084%
Hudson Housing Authority.....	1,223,133	0.078433%
Lincoln-Sudbury Regional School District.....	9,231,680	0.591977%
Nashoba Valley Technical High School District.....	3,632,610	0.232939%
North Chelmsford Water District.....	1,048,622	0.067242%
North Middlesex Regional School District.....	12,930,464	0.829159%
Shawsheen Valley Regional Vocational School.....	8,565,024	0.549228%
South Middlesex Regional Vocational Technical School.....	7,146,118	0.458241%
Sudbury Water District.....	2,025,843	0.129906%
Tewksbury Housing Authority.....	1,647,987	0.105676%
Wayland Housing Authority.....	719,713	0.046151%
Hopkinton Housing Authority.....	512,474	0.032862%
Sudbury Housing Authority.....	485,854	0.031155%
Wilmington Housing Authority.....	365,221	0.023420%
Acton Housing Authority.....	844,128	0.054129%
Burlington Housing Authority.....	145,929	0.009358%
Ayer Housing Authority.....	800,823	0.051352%
Holliston Housing Authority.....	158,430	0.010159%
Littleton Housing Authority.....	487,306	0.031248%
Westford Housing Authority.....	561,187	0.035986%
Shirley Water District.....	406,103	0.026041%
Tyngsborough Housing Authority.....	526,814	0.033789%
Pepperell Housing Authority.....	187,001	0.011991%
Groton Housing Authority.....	(9,522)	-0.000611%
Tyngsborough Water District.....	463,086	0.029895%
North Reading Housing Authority.....	159,024	0.010197%
West Groton Water.....	39,007	0.002501%
Ayer-Shirley Regional School District.....	5,157,881	0.330747%
Total.....	\$ 1,559,466,457	100.000%

See notes to schedule of employer allocations and schedule of pension amounts by employer.

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 48,182,609
Ending net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 53,545,751
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 109,552
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	2,386,731
Changes of assumptions.....	-	-	-	3,327,764
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	1,777,916
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 7,601,963
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 186,638
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	1,712,622
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 1,899,260
Pension Expense				
Proportionate share of plan pension expense.....	\$ 368,576	\$ -	\$ -	\$ 6,557,880
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(145,590)
Total Employer Pension Expense.....	\$ 368,576	\$ -	\$ -	\$ 6,412,290
Contributions				
Statutory required contribution.....	\$ 368,576	\$ -	\$ -	\$ 3,685,376
Contribution in relation to statutory required contribution.....	(368,576)	-	-	(3,690,854)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (5,478)
Contributions as a percentage of covered payroll.....	29.92%	0.00%	0.00%	25.07%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ -	\$ -	\$ -	\$ 2,051,624
June 30, 2021.....	-	-	-	1,495,350
June 30, 2022.....	-	-	-	1,217,386
June 30, 2023.....	-	-	-	938,343
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 5,702,703
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ -	\$ -	\$ -	\$ 64,953,397
Current discount rate (7.50%).....	\$ -	\$ -	\$ -	\$ 53,545,751
1% Increase (8.50%).....	\$ -	\$ -	\$ -	\$ 43,927,433
Covered Payroll.....	\$ 1,232,048	\$ -	\$ -	\$ 14,701,201
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 1,780,532	\$ 32,308,841	\$ 17,999,043	\$ 49,661,979
Ending net pension liability/(asset).....	\$ 2,175,376	\$ 36,199,958	\$ 20,317,285	\$ 55,208,123
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 4,451	\$ 74,063	\$ 41,568	\$ 112,953
Net difference between projected and actual investment earnings on pension plan investments.....	96,964	1,613,565	905,616	2,460,829
Changes of assumptions.....	135,195	2,249,757	1,262,680	3,431,077
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	410,745	1,870,821	963,144	453,855
Total Deferred Outflows of Resources.....	\$ 647,355	\$ 5,808,206	\$ 3,173,008	\$ 6,458,714
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 7,582	\$ 126,178	\$ 70,817	\$ 192,432
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	141,446	-	749,594	1,136,939
Total Deferred Inflows of Resources.....	\$ 149,028	\$ 126,178	\$ 820,411	\$ 1,329,371
Pension Expense				
Proportionate share of plan pension expense.....	\$ 266,423	\$ 4,433,499	\$ 2,488,307	\$ 6,761,473
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	75,658	806,262	(20,083)	(368,151)
Total Employer Pension Expense.....	\$ 342,081	\$ 5,239,761	\$ 2,468,224	\$ 6,393,322
Contributions				
Statutory required contribution.....	\$ 155,917	\$ 2,922,071	\$ 1,450,939	\$ 4,180,613
Contribution in relation to statutory required contribution.....	(155,917)	(2,923,952)	(1,450,939)	(4,185,942)
Contribution deficiency/(excess).....	\$ -	\$ (1,881)	\$ -	\$ (5,329)
Contributions as a percentage of covered payroll.....	13.65%	22.06%	21.86%	21.29%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 164,921	\$ 2,291,709	\$ 813,626	\$ 1,897,291
June 30, 2021.....	120,685	1,779,970	576,761	1,354,518
June 30, 2022.....	140,373	840,705	543,196	830,879
June 30, 2023.....	72,348	769,644	419,014	1,046,655
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 498,327	\$ 5,682,028	\$ 2,352,597	\$ 5,129,343
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 2,638,829	\$ 43,912,172	\$ 24,645,778	\$ 66,969,929
Current discount rate (7.50%).....	\$ 2,175,376	\$ 36,199,958	\$ 20,317,285	\$ 55,208,123
1% increase (8.50%).....	\$ 1,784,617	\$ 29,697,431	\$ 16,667,731	\$ 45,291,196
Covered Payroll.....	\$ 1,141,989	\$ 13,243,425	\$ 6,637,666	\$ 19,636,949

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 140,303,356	\$ 10,225,882	\$ 117,368,093	\$ 9,435,767
Ending net pension liability/(asset).....	\$ 150,770,372	\$ 11,266,225	\$ 127,441,167	\$ 11,157,139
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 308,471	\$ 23,050	\$ 260,737	\$ 22,827
Net difference between projected and actual investment earnings on pension plan investments.....	6,720,388	502,177	5,680,520	497,315
Changes of assumptions.....	9,370,081	700,174	7,920,220	693,394
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,430,707	589,053	1,244,565	836,534
Total Deferred Outflows of Resources.....	\$ 17,829,647	\$ 1,814,454	\$ 15,106,042	\$ 2,050,070
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 525,520	\$ 39,269	\$ 444,206	\$ 38,889
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	5,510,549	74,565	1,991,934	306,636
Total Deferred Inflows of Resources.....	\$ 6,036,069	\$ 113,834	\$ 2,436,140	\$ 345,525
Pension Expense				
Proportionate share of plan pension expense.....	\$ 18,465,217	\$ 1,379,802	\$ 15,608,036	\$ 1,366,442
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,276,360)	249,196	(263,259)	196,206
Total Employer Pension Expense.....	\$ 17,188,857	\$ 1,628,998	\$ 15,344,777	\$ 1,562,648
Contributions				
Statutory required contribution.....	\$ 11,509,447	\$ 843,801	\$ 9,454,623	\$ 932,452
Contribution in relation to statutory required contribution.....	(11,555,045)	(843,801)	(9,454,623)	(932,452)
Contribution deficiency/(excess).....	\$ (45,598)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	33.83%	28.38%	27.99%	17.43%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 4,910,436	\$ 711,498	\$ 4,966,229	\$ 654,037
June 30, 2021.....	3,822,327	579,928	3,855,220	462,234
June 30, 2022.....	1,051,184	214,756	1,983,489	247,348
June 30, 2023.....	2,009,631	194,438	1,864,964	340,926
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 11,793,578	\$ 1,700,620	\$ 12,669,902	\$ 1,704,545
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 182,891,222	\$ 13,666,436	\$ 154,591,850	\$ 13,534,110
Current discount rate (7.50%).....	\$ 150,770,372	\$ 11,266,225	\$ 127,441,167	\$ 11,157,139
1% increase (8.50%).....	\$ 123,687,789	\$ 9,242,495	\$ 104,549,161	\$ 9,153,004
Covered Payroll.....	\$ 34,022,034	\$ 2,973,629	\$ 33,783,442	\$ 5,350,293

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 103,993,778	\$ 60,106,114	\$ 2,563,856	\$ 21,402,700
Ending net pension liability/(asset).....	\$ 110,995,199	\$ 65,601,775	\$ 2,958,745	\$ 23,290,688
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 227,090	\$ 134,218	\$ 6,053	\$ 47,651
Net difference between projected and actual investment earnings on pension plan investments.....	4,947,463	2,924,112	131,882	1,038,151
Changes of assumptions.....	6,898,135	4,077,022	183,880	1,447,471
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,979,825	1,298,644	328,900	457,076
Total Deferred Outflows of Resources.....	\$ 14,052,513	\$ 8,433,996	\$ 650,715	\$ 2,980,349
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 386,882	\$ 228,660	\$ 10,313	\$ 81,181
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,473,354	764,548	154,201	853,434
Total Deferred Inflows of Resources.....	\$ 3,860,236	\$ 993,208	\$ 164,514	\$ 934,615
Pension Expense				
Proportionate share of plan pension expense.....	\$ 13,593,857	\$ 8,034,410	\$ 362,367	\$ 2,852,468
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(632,255)	226,833	39,260	(162,415)
Total Employer Pension Expense.....	\$ 12,961,602	\$ 8,261,243	\$ 401,627	\$ 2,690,053
Contributions				
Statutory required contribution.....	\$ 8,329,114	\$ 4,804,354	\$ 219,591	\$ 2,081,699
Contribution in relation to statutory required contribution.....	(8,579,114)	(4,835,041)	(219,591)	(2,081,699)
Contribution deficiency/(excess).....	\$ (250,000)	\$ (30,687)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	31.86%	31.35%	17.48%	27.59%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 3,922,378	\$ 2,918,771	\$ 160,670	\$ 793,309
June 30, 2021.....	3,110,661	2,259,718	117,813	593,903
June 30, 2022.....	1,796,743	1,250,706	134,348	248,143
June 30, 2023.....	1,362,495	1,011,593	73,370	420,379
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 10,192,277	\$ 7,440,788	\$ 486,201	\$ 2,055,734
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 134,642,154	\$ 79,577,895	\$ 3,589,090	\$ 28,252,649
Current discount rate (7.50%).....	\$ 110,995,199	\$ 65,601,775	\$ 2,958,745	\$ 23,290,688
1% increase (8.50%).....	\$ 91,057,350	\$ 53,817,857	\$ 2,427,271	\$ 19,107,028
Covered Payroll.....	\$ 26,145,209	\$ 15,326,864	\$ 1,256,546	\$ 7,545,657

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 23,773,972	\$ 20,653,839	\$ 63,161,014	\$ 24,841,810
Ending net pension liability/(asset).....	\$ 27,349,059	\$ 25,369,330	\$ 69,719,052	\$ 27,722,484
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 55,955	\$ 51,904	\$ 142,641	\$ 56,719
Net difference between projected and actual investment earnings on pension plan investments.....	1,219,048	1,130,804	3,107,634	1,235,693
Changes of assumptions.....	1,699,691	1,576,654	4,332,903	1,722,898
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,236,646	2,524,042	618,486	361,685
Total Deferred Outflows of Resources.....	\$ 4,211,340	\$ 5,283,404	\$ 8,201,664	\$ 3,376,995
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 95,327	\$ 88,427	\$ 243,011	\$ 96,629
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	768,650	413,500	143,038	566,145
Total Deferred Inflows of Resources.....	\$ 863,977	\$ 501,927	\$ 386,049	\$ 662,774
Pension Expense				
Proportionate share of plan pension expense.....	\$ 3,349,508	\$ 3,107,044	\$ 8,538,664	\$ 3,395,238
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	93,501	759,204	172,148	(81,445)
Total Employer Pension Expense.....	\$ 3,443,009	\$ 3,866,248	\$ 8,710,812	\$ 3,313,793
Contributions				
Statutory required contribution.....	\$ 2,183,620	\$ 2,105,634	\$ 5,344,369	\$ 2,148,246
Contribution in relation to statutory required contribution.....	(2,183,620)	(2,105,634)	(5,347,292)	(2,153,104)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (2,923)	\$ (4,858)
Contributions as a percentage of covered payroll.....	20.30%	14.51%	23.97%	21.21%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 1,215,757	\$ 1,800,226	\$ 3,033,035	\$ 1,056,131
June 30, 2021.....	816,085	1,235,129	2,273,121	722,077
June 30, 2022.....	620,544	824,261	1,258,700	382,345
June 30, 2023.....	694,977	921,861	1,250,759	553,668
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 3,347,363	\$ 4,781,477	\$ 7,815,615	\$ 2,714,221
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 33,175,635	\$ 30,774,135	\$ 84,572,336	\$ 33,628,616
Current discount rate (7.50%).....	\$ 27,349,059	\$ 25,369,330	\$ 69,719,052	\$ 27,722,484
1% increase (8.50%).....	\$ 22,436,401	\$ 20,812,287	\$ 57,195,553	\$ 22,742,749
Covered Payroll.....	\$ 10,756,680	\$ 14,508,629	\$ 22,297,722	\$ 10,130,693

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 21,432,789	\$ 48,035,495	\$ 16,341,195	\$ 10,500,304
Ending net pension liability/(asset).....	\$ 25,332,249	\$ 52,331,338	\$ 17,953,081	\$ 11,725,506
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 51,828	\$ 107,067	\$ 36,731	\$ 23,990
Net difference between projected and actual investment earnings on pension plan investments.....	1,129,151	2,332,600	800,235	522,649
Changes of assumptions.....	1,574,350	3,252,290	1,115,749	728,717
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,155,407	250,561	948,213	276,455
Total Deferred Outflows of Resources.....	\$ 5,910,736	\$ 5,942,518	\$ 2,900,928	\$ 1,551,811
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 88,297	\$ 182,405	\$ 62,577	\$ 40,870
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,382,261	1,062,881	263,669	321,500
Total Deferred Inflows of Resources.....	\$ 1,470,558	\$ 1,245,286	\$ 326,246	\$ 362,370
Pension Expense				
Proportionate share of plan pension expense.....	\$ 3,102,503	\$ 6,409,148	\$ 2,198,758	\$ 1,436,052
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	687,506	(350,507)	405,615	(40,154)
Total Employer Pension Expense.....	\$ 3,790,009	\$ 6,058,641	\$ 2,604,373	\$ 1,395,898
Contributions				
Statutory required contribution.....	\$ 2,185,944	\$ 3,861,918	\$ 1,337,920	\$ 975,181
Contribution in relation to statutory required contribution.....	(2,185,944)	(3,861,918)	(1,346,506)	(975,181)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (8,586)	\$ -
Contributions as a percentage of covered payroll.....	17.93%	29.40%	28.64%	23.70%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 1,726,999	\$ 1,796,888	\$ 1,142,315	\$ 441,000
June 30, 2021.....	1,269,588	1,352,211	905,577	298,743
June 30, 2022.....	657,433	756,637	225,150	201,351
June 30, 2023.....	786,158	791,496	301,640	248,347
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 4,440,178	\$ 4,697,232	\$ 2,574,682	\$ 1,189,441
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 30,729,154	\$ 63,480,260	\$ 21,777,892	\$ 14,223,565
Current discount rate (7.50%).....	\$ 25,332,249	\$ 52,331,338	\$ 17,953,081	\$ 11,725,506
1% increase (8.50%).....	\$ 20,781,867	\$ 42,931,163	\$ 14,728,204	\$ 9,619,276
Covered Payroll.....	\$ 12,191,742	\$ 13,135,392	\$ 4,672,305	\$ 4,115,258

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 8,406,745	\$ 10,459,477	\$ 58,772,716	\$ 98,006,180
Ending net pension liability/(asset).....	\$ 9,113,056	\$ 11,645,337	\$ 63,931,576	\$ 104,461,551
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 18,645	\$ 23,826	\$ 130,800	\$ 213,722
Net difference between projected and actual investment earnings on pension plan investments.....	406,202	519,075	2,849,665	4,656,235
Changes of assumptions.....	566,359	723,735	3,973,223	6,492,081
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	157,949	240,660	1,243,640	2,351,574
Total Deferred Outflows of Resources.....	\$ 1,149,155	\$ 1,507,296	\$ 8,197,328	\$ 13,713,612
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 31,764	\$ 40,591	\$ 222,838	\$ 364,108
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	760,707	72,881	1,601,817	2,940,083
Total Deferred Inflows of Resources.....	\$ 792,471	\$ 113,472	\$ 1,824,655	\$ 3,304,191
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,116,096	\$ 1,426,232	\$ 7,829,857	\$ 12,793,664
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(264,419)	75,176	(187,906)	(237,888)
Total Employer Pension Expense.....	\$ 851,677	\$ 1,501,408	\$ 7,641,951	\$ 12,555,776
Contributions				
Statutory required contribution.....	\$ 801,553	\$ 881,015	\$ 4,468,265	\$ 7,971,708
Contribution in relation to statutory required contribution.....	(801,553)	(881,015)	(4,468,265)	(7,972,598)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (890)
Contributions as a percentage of covered payroll.....	45.16%	23.58%	26.98%	35.05%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 109,532	\$ 553,036	\$ 2,435,497	\$ 4,048,643
June 30, 2021.....	25,391	421,995	1,916,089	3,321,338
June 30, 2022.....	65,919	195,421	1,120,738	1,802,451
June 30, 2023.....	155,842	223,372	900,349	1,236,989
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 356,684	\$ 1,393,824	\$ 6,372,673	\$ 10,409,421
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 11,054,546	\$ 14,126,316	\$ 77,551,869	\$ 126,716,546
Current discount rate (7.50%).....	\$ 9,113,056	\$ 11,645,337	\$ 63,931,576	\$ 104,461,551
1% increase (8.50%).....	\$ 7,476,096	\$ 9,553,508	\$ 52,447,673	\$ 85,697,328
Covered Payroll.....	\$ 1,774,737	\$ 3,736,697	\$ 16,560,368	\$ 22,741,155

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 8,090,096	\$ 20,897,452	\$ 53,697,606	\$ 51,698,881
Ending net pension liability/(asset).....	\$ 9,256,011	\$ 23,277,997	\$ 59,255,947	\$ 59,376,424
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 18,937	\$ 47,625	\$ 121,234	\$ 121,481
Net difference between projected and actual investment earnings on pension plan investments.....	412,574	1,037,586	2,641,255	2,646,625
Changes of assumptions.....	575,243	1,446,682	3,682,641	3,690,129
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	782,056	1,550,510	293,783	2,957,496
Total Deferred Outflows of Resources.....	\$ 1,788,810	\$ 4,082,403	\$ 6,738,913	\$ 9,415,731
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 32,263	\$ 81,137	\$ 206,541	\$ 206,961
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	588,962	1,089,334	2,040,065	696,089
Total Deferred Inflows of Resources.....	\$ 621,225	\$ 1,170,471	\$ 2,246,606	\$ 903,050
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,133,606	\$ 2,850,913	\$ 7,257,222	\$ 7,271,974
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	130,978	345,568	(760,411)	847,094
Total Employer Pension Expense.....	\$ 1,264,584	\$ 3,196,481	\$ 6,496,811	\$ 8,119,068
Contributions				
Statutory required contribution.....	\$ 812,598	\$ 1,951,803	\$ 4,648,984	\$ 4,902,690
Contribution in relation to statutory required contribution.....	(812,598)	(1,955,622)	(4,648,984)	(4,902,690)
Contribution deficiency/(excess).....	\$ -	\$ (3,819)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.52%	23.02%	24.26%	19.37%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 510,796	\$ 1,300,771	\$ 1,671,126	\$ 3,283,577
June 30, 2021.....	359,412	976,502	1,069,239	2,398,159
June 30, 2022.....	55,677	147,363	670,947	1,305,438
June 30, 2023.....	241,700	487,296	1,080,995	1,525,507
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,167,585	\$ 2,911,932	\$ 4,492,307	\$ 8,512,681
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 11,227,956	\$ 28,237,254	\$ 71,880,121	\$ 72,026,265
Current discount rate (7.50%).....	\$ 9,256,011	\$ 23,277,997	\$ 59,255,947	\$ 59,376,424
1% increase (8.50%).....	\$ 7,593,372	\$ 19,096,616	\$ 48,611,918	\$ 48,710,754
Covered Payroll.....	\$ 3,184,331	\$ 8,478,467	\$ 19,166,003	\$ 25,307,496

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 61,375,790	\$ 83,422,615	\$ 27,084,083	\$ 3,370,594
Ending net pension liability/(asset).....	\$ 66,869,588	\$ 90,145,064	\$ 29,957,174	\$ 3,740,627
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 136,811	\$ 184,432	\$ 61,291	\$ 7,653
Net difference between projected and actual investment earnings on pension plan investments.....	2,980,623	4,018,096	1,335,301	166,733
Changes of assumptions.....	4,155,814	5,602,340	1,861,780	232,473
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	1,061,186	948,454	146,109
Total Deferred Outflows of Resources.....	\$ 7,273,248	\$ 10,866,054	\$ 4,206,826	\$ 552,968
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 233,079	\$ 314,207	\$ 104,418	\$ 13,038
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,243,489	1,216,680	212,867	137,090
Total Deferred Inflows of Resources.....	\$ 2,476,568	\$ 1,530,887	\$ 317,285	\$ 150,128
Pension Expense				
Proportionate share of plan pension expense.....	\$ 8,189,684	\$ 11,040,288	\$ 3,668,929	\$ 458,124
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(859,992)	(68,862)	352,580	13,411
Total Employer Pension Expense.....	\$ 7,329,692	\$ 10,971,426	\$ 4,021,509	\$ 471,535
Contributions				
Statutory required contribution.....	\$ 5,114,630	\$ 6,535,038	\$ 2,467,453	\$ 218,063
Contribution in relation to statutory required contribution.....	(5,114,630)	(7,037,178)	(2,467,453)	(218,063)
Contribution deficiency/(excess).....	\$ -	\$ (502,140)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.96%	27.77%	18.37%	18.34%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 1,883,969	\$ 3,630,199	\$ 1,581,855	\$ 166,904
June 30, 2021.....	1,321,465	2,904,971	1,227,867	132,888
June 30, 2022.....	543,053	1,486,098	498,122	46,315
June 30, 2023.....	1,048,193	1,313,899	581,697	56,733
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 4,796,680	\$ 9,335,167	\$ 3,889,541	\$ 402,840
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 81,115,809	\$ 109,350,005	\$ 36,339,395	\$ 4,537,548
Current discount rate (7.50%).....	\$ 66,869,588	\$ 90,145,064	\$ 29,957,174	\$ 3,740,627
1% increase (8.50%).....	\$ 54,857,935	\$ 73,952,483	\$ 24,576,026	\$ 3,068,706
Covered Payroll.....	\$ 19,704,147	\$ 23,536,318	\$ 13,431,428	\$ 1,188,771
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 313,455	\$ 1,359,538	\$ 2,029,608	\$ 391,160
Ending net pension liability/(asset).....	\$ 341,646	\$ 1,441,037	\$ 2,441,133	\$ 708,793
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 699	\$ 2,948	\$ 4,994	\$ 1,450
Net difference between projected and actual investment earnings on pension plan investments.....	15,228	64,232	108,810	31,594
Changes of assumptions.....	21,233	89,558	151,712	44,050
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	17,415	66,150	627,700	1,356,463
Total Deferred Outflows of Resources.....	\$ 54,575	\$ 222,888	\$ 893,216	\$ 1,433,557
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 1,191	\$ 5,023	\$ 8,509	\$ 2,471
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,898	52,792	27,066	707,300
Total Deferred Inflows of Resources.....	\$ 3,089	\$ 57,815	\$ 35,575	\$ 709,771
Pension Expense				
Proportionate share of plan pension expense.....	\$ 41,843	\$ 176,486	\$ 298,971	\$ 86,801
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	7,696	14,383	194,789	227,027
Total Employer Pension Expense.....	\$ 49,539	\$ 190,869	\$ 493,760	\$ 313,828
Contributions				
Statutory required contribution.....	\$ 31,094	\$ 107,677	\$ 119,217	\$ 115,058
Contribution in relation to statutory required contribution.....	(31,094)	(107,677)	(179,217)	(506,218)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (60,000)	\$ (391,160)
Contributions as a percentage of covered payroll.....	18.89%	35.53%	4.79%	8.27%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 21,713	\$ 73,515	\$ 294,961	\$ 256,105
June 30, 2021.....	16,636	62,326	257,553	192,895
June 30, 2022.....	6,764	14,039	228,986	124,853
June 30, 2023.....	6,373	15,193	76,141	149,933
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 51,486	\$ 165,073	\$ 857,641	\$ 723,786
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 414,432	\$ 1,748,043	\$ 2,981,204	\$ 859,798
Current discount rate (7.50%).....	\$ 341,646	\$ 1,441,037	\$ 2,441,133	\$ 708,793
1% increase (8.50%).....	\$ 280,277	\$ 1,182,186	\$ 2,002,637	\$ 581,474
Covered Payroll.....	\$ 164,645	\$ 303,046	\$ 2,487,822	\$ 1,390,459

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 2,055,364	\$ 3,031,987	\$ 317,151	\$ 509,331
Ending net pension liability/(asset).....	\$ 2,173,260	\$ 3,288,228	\$ 381,924	\$ 662,694
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 4,446	\$ 6,728	\$ 781	\$ 1,356
Net difference between projected and actual investment earnings on pension plan investments.....	96,870	146,568	17,024	29,539
Changes of assumptions.....	135,064	204,357	23,736	41,185
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	80,256	257,123	31,954	97,139
Total Deferred Outflows of Resources.....	\$ 316,636	\$ 614,776	\$ 73,495	\$ 169,219
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 7,575	\$ 11,461	\$ 1,331	\$ 2,310
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	159,310	211,159	2,727	47,553
Total Deferred Inflows of Resources.....	\$ 166,885	\$ 222,620	\$ 4,058	\$ 49,863
Pension Expense				
Proportionate share of plan pension expense.....	\$ 266,164	\$ 402,717	\$ 46,774	\$ 81,163
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(34,480)	4,872	10,842	20,608
Total Employer Pension Expense.....	\$ 231,684	\$ 407,589	\$ 57,616	\$ 101,771
Contributions				
Statutory required contribution.....	\$ 131,218	\$ 173,855	\$ 30,295	\$ 46,515
Contribution in relation to statutory required contribution.....	(131,218)	(173,855)	(30,295)	(46,515)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	33.64%	27.23%	15.04%	14.07%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 54,701	\$ 139,805	\$ 26,510	\$ 47,801
June 30, 2021.....	48,374	120,647	18,876	29,812
June 30, 2022.....	30,932	98,286	11,615	13,722
June 30, 2023.....	15,744	33,418	12,436	28,021
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 149,751	\$ 392,156	\$ 69,437	\$ 119,356
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 2,636,262	\$ 3,988,768	\$ 463,291	\$ 803,878
Current discount rate (7.50%).....	\$ 2,173,260	\$ 3,288,228	\$ 381,924	\$ 662,694
1% increase (8.50%).....	\$ 1,782,882	\$ 2,697,570	\$ 313,320	\$ 543,656
Covered Payroll.....	\$ 390,058	\$ 638,374	\$ 201,450	\$ 330,632

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Greater Lowell Regional Vocation Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 15,614,520	\$ 10,714,454	\$ 1,155,540	\$ 8,466,429
Ending net pension liability/(asset).....	\$ 16,800,249	\$ 12,305,499	\$ 1,223,133	\$ 9,231,680
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 34,372	\$ 25,176	\$ 2,502	\$ 18,887
Net difference between projected and actual investment earnings on pension plan investments.....	748,849	548,501	54,520	411,490
Changes of assumptions.....	1,044,103	764,763	76,015	573,731
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	378,386	971,231	14,608	153,101
Total Deferred Outflows of Resources.....	\$ 2,205,710	\$ 2,309,671	\$ 147,645	\$ 1,157,209
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 58,559	\$ 42,892	\$ 4,263	\$ 32,178
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	817,584	44,670	231,953	365,458
Total Deferred Inflows of Resources.....	\$ 876,143	\$ 87,562	\$ 236,216	\$ 397,636
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,057,567	\$ 1,507,086	\$ 149,800	\$ 1,130,628
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(219,944)	388,053	(83,500)	(110,445)
Total Employer Pension Expense.....	\$ 1,837,623	\$ 1,895,139	\$ 66,300	\$ 1,020,183
Contributions				
Statutory required contribution.....	\$ 1,250,787	\$ 913,825	\$ 107,481	\$ 646,913
Contribution in relation to statutory required contribution.....	(1,252,691)	(913,825)	(107,481)	(646,913)
Contribution deficiency/(excess).....	\$ (1,904)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	28.03%	20.23%	39.86%	21.07%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 469,444	\$ 893,002	\$ (33,310)	\$ 268,377
June 30, 2021.....	340,287	693,027	(36,603)	199,473
June 30, 2022.....	299,259	340,390	(34,476)	157,586
June 30, 2023.....	220,577	295,690	15,818	134,137
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,329,567	\$ 2,222,109	\$ (88,571)	\$ 759,573
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 20,379,455	\$ 14,927,122	\$ 1,483,715	\$ 11,198,442
Current discount rate (7.50%).....	\$ 16,800,249	\$ 12,305,499	\$ 1,223,133	\$ 9,231,680
1% increase (8.50%).....	\$ 13,782,453	\$ 10,095,086	\$ 1,003,424	\$ 7,573,411
Covered Payroll.....	\$ 4,461,921	\$ 4,516,101	\$ 269,655	\$ 3,070,023
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 3,512,891	\$ 814,336	\$ 11,610,214	\$ 7,940,619
Ending net pension liability/(asset).....	\$ 3,632,610	\$ 1,048,622	\$ 12,930,464	\$ 8,565,024
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 7,432	\$ 2,145	\$ 26,455	\$ 17,524
Net difference between projected and actual investment earnings on pension plan investments.....	161,919	46,741	576,358	381,775
Changes of assumptions.....	225,760	65,170	803,603	532,300
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	136,724	175,940	144,238	129,212
Total Deferred Outflows of Resources.....	\$ 531,835	\$ 289,996	\$ 1,550,654	\$ 1,060,811
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 12,662	\$ 3,655	\$ 45,070	\$ 29,854
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	279,761	92,145	238,946	467,997
Total Deferred Inflows of Resources.....	\$ 292,423	\$ 95,800	\$ 284,016	\$ 497,851
Pension Expense				
Proportionate share of plan pension expense.....	\$ 444,893	\$ 128,426	\$ 1,583,626	\$ 1,048,979
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(64,033)	21,354	(40,937)	(105,507)
Total Employer Pension Expense.....	\$ 380,860	\$ 149,780	\$ 1,542,689	\$ 943,472
Contributions				
Statutory required contribution.....	\$ 271,217	\$ 44,274	\$ 974,640	\$ 661,694
Contribution in relation to statutory required contribution.....	(271,217)	(44,274)	(974,640)	(662,826)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (1,132)
Contributions as a percentage of covered payroll.....	26.35%	7.62%	19.22%	24.81%
Deferred Outflows/(Inflows) Recognized In Future Pension Expense				
June 30, 2020.....	\$ 85,030	\$ 64,384	\$ 489,660	\$ 245,953
June 30, 2021.....	75,037	43,240	336,238	185,680
June 30, 2022.....	57,086	49,672	192,783	10,321
June 30, 2023.....	22,259	36,900	247,957	121,006
Total Deferred Outflows/(Inflows) Recognized In Future Pension Expense.....	\$ 239,412	\$ 194,196	\$ 1,266,638	\$ 562,960
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 4,406,519	\$ 1,272,026	\$ 15,685,233	\$ 10,389,758
Current discount rate (7.50%).....	\$ 3,632,610	\$ 1,048,622	\$ 12,930,464	\$ 8,565,024
1% increase (8.50%).....	\$ 2,980,091	\$ 860,260	\$ 10,607,790	\$ 7,026,506
Covered Payroll.....	\$ 1,029,331	\$ 581,217	\$ 5,070,233	\$ 2,666,605

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 6,492,906	\$ 1,701,694	\$ 1,527,710	\$ 611,202
Ending net pension liability/(asset).....	\$ 7,146,118	\$ 2,025,843	\$ 1,647,987	\$ 719,713
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 14,621	\$ 4,145	\$ 3,372	\$ 1,472
Net difference between projected and actual investment earnings on pension plan investments.....	318,529	90,299	73,457	32,080
Changes of assumptions.....	444,117	125,902	102,419	44,729
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	91,490	252,239	62,887	79,630
Total Deferred Outflows of Resources.....	\$ 868,757	\$ 472,585	\$ 242,135	\$ 157,911
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 24,908	\$ 7,061	\$ 5,744	\$ 2,509
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	439,569	228,531	25,542	18,872
Total Deferred Inflows of Resources.....	\$ 464,477	\$ 235,592	\$ 31,286	\$ 21,381
Pension Expense				
Proportionate share of plan pension expense.....	\$ 875,203	\$ 248,111	\$ 201,833	\$ 88,145
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(112,327)	18,695	20,054	27,307
Total Employer Pension Expense.....	\$ 762,876	\$ 266,806	\$ 221,887	\$ 115,452
Contributions				
Statutory required contribution.....	\$ 577,388	\$ 128,447	\$ 131,057	\$ 45,169
Contribution in relation to statutory required contribution.....	(577,388)	(128,447)	(131,057)	(45,169)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	23.76%	14.63%	29.19%	15.36%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 180,910	\$ 101,823	\$ 87,677	\$ 56,840
June 30, 2021.....	110,892	84,368	72,017	44,823
June 30, 2022.....	(18,041)	(5,091)	27,143	16,344
June 30, 2023.....	130,519	55,893	24,012	18,523
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 404,280	\$ 236,993	\$ 210,849	\$ 136,530
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 8,668,562	\$ 2,457,438	\$ 1,999,082	\$ 873,044
Current discount rate (7.50%).....	\$ 7,146,118	\$ 2,025,843	\$ 1,647,987	\$ 719,713
1% increase (8.50%).....	\$ 5,862,475	\$ 1,661,945	\$ 1,351,962	\$ 590,432
Covered Payroll.....	\$ 2,430,243	\$ 877,884	\$ 448,977	\$ 294,119

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 458,176	\$ 436,617	\$ 335,690	\$ 741,792
Ending net pension liability/(asset).....	\$ 512,474	\$ 485,854	\$ 365,221	\$ 844,128
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,048	\$ 994	\$ 747	\$ 1,727
Net difference between projected and actual investment earnings on pension plan investments.....	22,843	21,656	16,279	37,626
Changes of assumptions.....	31,849	30,195	22,698	52,461
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	20,011	71,282	19,161	64,872
Total Deferred Outflows of Resources.....	\$ 75,751	\$ 124,127	\$ 58,885	\$ 156,686
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 1,786	\$ 1,693	\$ 1,273	\$ 2,942
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	36,618	11,188	2,700	137,107
Total Deferred Inflows of Resources.....	\$ 38,404	\$ 12,881	\$ 3,973	\$ 140,049
Pension Expense				
Proportionate share of plan pension expense.....	\$ 62,764	\$ 59,503	\$ 44,730	\$ 103,383
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(2,670)	27,202	7,097	(19,491)
Total Employer Pension Expense.....	\$ 60,094	\$ 86,705	\$ 51,827	\$ 83,892
Contributions				
Statutory required contribution.....	\$ 38,114	\$ 30,394	\$ 30,100	\$ 74,503
Contribution in relation to statutory required contribution.....	(38,114)	(30,394)	(30,100)	(74,503)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	53.77%	20.65%	23.07%	19.36%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 18,360	\$ 47,137	\$ 22,083	\$ 15,146
June 30, 2021.....	9,954	37,867	18,000	2,891
June 30, 2022.....	(1,059)	18,240	8,761	(22,780)
June 30, 2023.....	10,092	8,002	6,068	21,380
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 37,347	\$ 111,246	\$ 54,912	\$ 16,637
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 621,654	\$ 589,363	\$ 443,029	\$ 1,023,965
Current discount rate (7.50%).....	\$ 512,474	\$ 485,854	\$ 365,221	\$ 844,128
1% increase (8.50%).....	\$ 420,419	\$ 398,581	\$ 299,617	\$ 692,499
Covered Payroll.....	\$ 70,880	\$ 147,169	\$ 130,465	\$ 384,874

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 56,771	\$ 792,328	\$ 142,446	\$ 465,317
Ending net pension liability/(asset).....	\$ 145,929	\$ 800,823	\$ 158,430	\$ 487,306
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 299	\$ 1,638	\$ 324	\$ 997
Net difference between projected and actual investment earnings on pension plan investments.....	6,505	35,696	7,062	21,721
Changes of assumptions.....	9,069	49,770	9,846	30,285
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	75,800	501,861	16,454	25,773
Total Deferred Outflows of Resources.....	\$ 91,673	\$ 588,965	\$ 33,686	\$ 78,776
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 509	\$ 2,791	\$ 552	\$ 1,699
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	30,277	682,110	48,541	19,968
Total Deferred Inflows of Resources.....	\$ 30,786	\$ 684,901	\$ 49,093	\$ 21,667
Pension Expense				
Proportionate share of plan pension expense.....	\$ 17,871	\$ 98,079	\$ 19,403	\$ 59,683
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	14,961	17,805	(9,398)	4,404
Total Employer Pension Expense.....	\$ 32,832	\$ 115,884	\$ 10,005	\$ 64,087
Contributions				
Statutory required contribution.....	\$ 6,786	\$ 73,633	\$ 19,726	\$ 40,349
Contribution in relation to statutory required contribution.....	(6,786)	(73,633)	(19,726)	(40,349)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	5.28%	64.46%	33.09%	45.71%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 20,953	\$ 50,670	\$ (2,894)	\$ 24,404
June 30, 2021.....	7,638	42,793	(7,744)	21,709
June 30, 2022.....	16,479	(193,732)	(9,330)	6,112
June 30, 2023.....	15,817	4,333	4,561	4,884
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 60,887	\$ (95,936)	\$ (15,407)	\$ 57,109
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 177,018	\$ 971,434	\$ 192,183	\$ 591,124
Current discount rate (7.50%).....	\$ 145,929	\$ 800,823	\$ 158,430	\$ 487,306
1% increase (8.50%).....	\$ 119,716	\$ 656,973	\$ 129,972	\$ 399,772
Covered Payroll.....	\$ 128,572	\$ 114,235	\$ 59,614	\$ 88,268

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 517,839	\$ 335,341	\$ 496,440	\$ 175,037
Ending net pension liability/(asset).....	\$ 561,187	\$ 406,103	\$ 526,614	\$ 187,001
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,148	\$ 831	\$ 1,077	\$ 383
Net difference between projected and actual investment earnings on pension plan investments.....	25,014	18,102	23,473	8,335
Changes of assumptions.....	34,877	25,239	32,728	11,622
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	30,375	28,772	27,769	26,151
Total Deferred Outflows of Resources.....	\$ 91,414	\$ 72,944	\$ 85,047	\$ 46,491
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 1,956	\$ 1,416	\$ 1,836	\$ 652
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	5,327	43,186	18,409	5,105
Total Deferred Inflows of Resources.....	\$ 7,283	\$ 44,602	\$ 20,245	\$ 5,757
Pension Expense				
Proportionate share of plan pension expense.....	\$ 68,732	\$ 49,735	\$ 64,498	\$ 22,903
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	10,860	(7,881)	3,205	10,546
Total Employer Pension Expense.....	\$ 79,592	\$ 41,854	\$ 67,703	\$ 33,449
Contributions				
Statutory required contribution.....	\$ 46,011	\$ 21,013	\$ 39,858	\$ 14,362
Contribution in relation to statutory required contribution.....	(46,011)	(21,013)	(39,858)	(14,362)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.72%	10.22%	24.72%	14.76%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ 33,887	\$ 8,784	\$ 24,813	\$ 18,223
June 30, 2021.....	25,813	3,444	22,435	15,492
June 30, 2022.....	15,532	4,778	11,827	4,711
June 30, 2023.....	8,899	11,336	5,727	2,308
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 84,131	\$ 28,342	\$ 64,802	\$ 40,734
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 680,745	\$ 492,621	\$ 638,806	\$ 226,841
Current discount rate (7.50%).....	\$ 561,187	\$ 406,103	\$ 526,614	\$ 187,001
1% Increase (8.50%).....	\$ 460,382	\$ 333,156	\$ 432,019	\$ 153,410
Covered Payroll.....	\$ 125,299	\$ 205,648	\$ 161,241	\$ 97,327

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ (15,094)	\$ 380,399	\$ 139,940	\$ 21,871
Ending net pension liability/(asset).....	\$ (9,522)	\$ 463,086	\$ 159,024	\$ 39,007
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 14	\$ 947	\$ 325	\$ 80
Net difference between projected and actual investment earnings on pension plan investments.....	-	20,641	7,088	1,739
Changes of assumptions.....	-	28,780	9,883	2,424
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	11,068	35,126	29,457	20,125
Total Deferred Outflows of Resources.....	\$ 11,082	\$ 85,494	\$ 46,753	\$ 24,368
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 1,614	\$ 554	\$ 136
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	15,431	16,921	4,049	6,963
Total Deferred Inflows of Resources.....	\$ 15,431	\$ 18,535	\$ 4,603	\$ 7,099
Pension Expense				
Proportionate share of plan pension expense.....	\$ (1,167)	\$ 56,717	\$ 19,477	\$ 4,777
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,073)	5,994	11,830	5,336
Total Employer Pension Expense.....	\$ (2,240)	\$ 62,711	\$ 31,307	\$ 10,113
Contributions				
Statutory required contribution.....	\$ 3,223	\$ 33,753	\$ 16,393	\$ 1,039
Contribution in relation to statutory required contribution.....	(3,223)	(33,753)	(16,393)	(1,039)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	9.80%	16.34%	18.96%	0.88%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2020.....	\$ (1,464)	\$ 24,995	\$ 18,358	\$ 6,937
June 30, 2021.....	(2,269)	16,485	15,560	3,307
June 30, 2022.....	(2,446)	10,223	3,769	4,203
June 30, 2023.....	1,830	15,256	4,463	2,822
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (4,349)	\$ 66,959	\$ 42,150	\$ 17,269
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ (11,551)	\$ 561,744	\$ 192,903	\$ 47,317
Current discount rate (7.50%).....	\$ (9,522)	\$ 463,086	\$ 159,024	\$ 39,007
1% Increase (8.50%).....	\$ (7,812)	\$ 379,903	\$ 130,459	\$ 32,000
Covered Payroll.....	\$ 32,885	\$ 206,601	\$ 86,451	\$ 118,199

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2018

	Ayer-Shirley Regional School District	Totals
Net Pension Liability		
Beginning net pension liability/(asset).....	\$ 4,178,529	\$ 1,419,184,751
Ending net pension liability/(asset).....	\$ 5,157,881	\$ 1,559,466,457
Deferred Outflows of Resources		
Differences between expected and actual experience.....	\$ 10,553	\$ 3,190,613
Net difference between projected and actual investment earnings on pension plan investments.....	229,906	69,511,566
Changes of assumptions.....	320,552	96,918,387
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	540,342	41,414,982
Total Deferred Outflows of Resources.....	\$ 1,101,353	\$ 211,035,548
Deferred Inflows of Resources		
Differences between expected and actual experience.....	\$ 17,978	\$ 5,435,668
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	479,735	41,415,998
Total Deferred Inflows of Resources.....	\$ 497,713	\$ 46,851,666
Pension Expense		
Proportionate share of plan pension expense.....	\$ 631,698	\$ 191,360,263
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(19,733)	-
Total Employer Pension Expense.....	\$ 611,965	\$ 191,360,263
Contributions		
Statutory required contribution.....	\$ 446,008	\$ 119,298,291
Contribution in relation to statutory required contribution.....	(446,008)	(120,614,676)
Contribution deficiency/(excess).....	\$ -	\$ (1,316,385)
Contributions as a percentage of covered payroll.....	11.99%	25.32%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense		
June 30, 2020.....	\$ 191,919	\$ 63,991,967
June 30, 2021.....	101,475	48,307,383
June 30, 2022.....	115,388	24,976,068
June 30, 2023.....	194,858	26,908,464
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 603,640	\$ 164,183,882
Discount Rate Sensitivity		
1% decrease (6.50%).....	\$ 6,256,741	\$ 1,891,702,743
Current discount rate (7.50%).....	\$ 5,157,881	\$ 1,559,466,457
1% increase (8.50%).....	\$ 4,231,381	\$ 1,279,342,562
Covered Payroll.....	\$ 3,719,371	\$ 471,115,185
See notes to schedule of employer allocations and schedule of pension amounts by employer.		(Concluded)

NOTE I – Schedule of Employer Allocations

Governmental Accounting Standards Board (GASB) Statement #68 requires employers participating in a cost-sharing pension plan to recognize pension liabilities as employees provide services to the government and earn their pension benefits. Employers participating in cost-sharing plans are required to recognize their proportionate share of the plan's collective pension amounts for all benefits provided through the plan including the net pension liability, deferred outflows of resources, deferred inflows of resources, pension expense, and contributions.

GASB Statement #68 requires the allocation of the collective pension amounts be consistent with the manner in which contributions to the plan are determined. As permissible under GASB Statement #68, The Schedule of Employer Allocations is used to demonstrate the allocation of Middlesex County Retirement System's collective pension amounts.

Massachusetts General Law (MGL) Chapter 32 Section 22 Paragraph 7c dictates that Massachusetts cost sharing defined benefit pension plans allocate the annual required pension fund appropriation to employer units based on their proportionate share of the aggregate of the annual rates of regular compensation of all members in service of the system. The Public Employee Retirement Administration Commission (PERAC) approves each system's proportionate share of the annual required contribution. PERAC can accept alternative allocation methodologies and as such the System has elected to use an actuarial based allocation methodology. Accordingly, each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the System's net position at year end is calculated by starting with the balance carried forward from the prior year. Each member unit is then credited with the actual required contribution received during the year along with any excess contributions received. Each member unit's share is reduced by the actual payment made to their specific retirees. Net investment income is allocated based on each member's money-weighted rate of return. All other shared expenses are allocated based the proportionate share of the total pension liability. The difference between the total pension liability and the net position is reported as the net pension liability.

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County and Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2018, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the System's funding schedule. No assets have been allocated to cover the remaining liability and therefore the liability has been allocated to the remaining member units.

The current employees, retirees, beneficiaries and inactive participants of the Middlesex County Retirement System have been identified and their total pension liability has been actuarially determined. For transparency purposes, the System has historically paid a contribution as an employer to itself. However with the implementation of GASB 67 & 68 the net pension liability is allocated to each member unit.

When a member unit accepts an Early Retirement Incentive Program (E.R.I. or ERIP), PERAC completes an analysis of the costs and liabilities attributable to the additional benefits payable in accordance with the ERIP. The accrued liability for the members who accept the ERIP as retirees including the ERIP less the accrued liability for the members as active employees excluding the ERIP represents the increase in accrued liability due to the ERIP. The net increase is amortized for each member unit accepting the ERIP and is separately identified in the system's funding schedule. The 2002 ERIP amortization is straight line ending in fiscal 2019. The 2003 ERIP

amortization is straight line ending in fiscal 2020. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE II – Schedule of Pension Amounts by Employer

The Schedule of Pension Amounts by Employer presents the net pension liability, the various categories of deferred outflows of resources and deferred inflows of resources, contributions and pension expense for all participating employers including differences between expected and actual economic experience; differences between projected and actual investment earnings, net; and changes of assumptions.

Changes in Assumptions

The following assumption changes were reflected in the January 1, 2018 actuarial valuation:

- The mortality tables for healthy participants were changed from the RP-2000 Employee and Healthy Annuitant Mortality Tables projected generationally using Scale BB2D from 2009 to the RP-2014 Blue Collar Employee and Healthy Annuitant Mortality Tables projected generationally using Scale MP-2017.
- The mortality tables for disabled participants were changed from the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale BB2D from 2015 to the RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward 1 year projected generationally using Scale MP-2017.
- The long-term salary increase assumption was lowered by 0.25%, to 4.00% for Group 1 participants, 4.25% for Group 2 participants, and 4.50% for Group 4 participants.
- The investment rate of return assumption was reduced from 7.75% to 7.50%.
- The inflation rate was reduced to 3.25% from the previous rate of 3.50%.

Changes in Plan Provisions

None.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2017

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2017

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Financial Section



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

Report on the Financial Statements

We have audited the accompanying financial statements of Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2017, and the related notes to the financial statements, which collectively comprise the Middlesex County Retirement System's financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Middlesex County Retirement System as of December 31, 2017, and the results of its operations and changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis; the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Returns be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated August 7, 2018, on our consideration of the Middlesex County Retirement System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Middlesex County Retirement System's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System, the Public Employee Retirement Administration Commission and all member units and is not intended to be and should not be used by anyone other than these specified parties.



August 7, 2018

Management's Discussion and Analysis

As management of the Middlesex County Retirement System, we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2017. The System complies with financial reporting requirements issued by the Governmental Accounting Standards Board (GASB).

The GASB is the authoritative standard setting body that provides guidance on how to prepare financial statements in conformity with generally accepted accounting principles (GAAP). Users of these financial statements rely on the GASB to establish consistent reporting standards for all governments in the United States. This consistent application is the only way users can assess the financial condition of a public retirement system compared to others.

Financial Highlights

- The System's assets exceeded its liabilities at the close of the most recent year by \$1.4 billion (net position).
- The System's net position increased by \$195.9 million for the year ended December 31, 2017.
- Total investment income was \$195.7 million; investment expenses were \$6.4 million; and net investment income was \$189.3 million.
- Total contributions were \$170.0 million, primarily consisting of \$115.4 million from employers, \$44.2 from members, \$5.7 million in transfers from other systems and \$3.6 million from other retirement systems for their share of retiree pension payments.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$160.1 million.
- Depreciation, administrative and building expenses were \$3.2 million.
- The Total Pension Liability is \$2.8 billion as of December 31, 2017, while the Net Pension Liability is \$1.4 billion.
- The Plan fiduciary net position as a percentage of the total pension liability is 49.27%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the System fiduciary financial statements. These fiduciary financial statements comprise of four components: 1) management's discussion and analysis, 2) fiduciary financial statements, 3) notes to the financial statements and 4) required supplementary information.

Fiduciary Financial Statements

The *statement of net position* presents information on all assets and deferred outflows less deferred inflows and liabilities with the difference reported as *net position*. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position is improving or deteriorating.

The *statement of changes in fiduciary net position* presents information showing how the system's net position changed during the most recent year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, *regardless of the timing of related cash flows*. Thus, additions and deductions are reported in this statement for some items that will only result in cash flows in future periods.

Notes to the financial statements

The notes provide additional information that is essential to a full understanding of the data provided in the fiduciary financial statements.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Returns be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context.

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the System's financial position. The System's net position exceeded liabilities by \$1.4 billion at the close of 2017.

The assets accumulated are held to provide pension benefits for qualified retirees along with active and inactive employees of the member units. At year-end the system's net position include investments of \$1.3 billion, cash of \$58.8 million and current accounts receivable of \$9.1 million. The system also had capital assets, net of accumulated depreciation of \$5.4 million at year-end primarily consisting of land, an office building, and building improvements.

In 2017 the System's contributions were \$170.0 million while deductions were \$163.4 million which resulted in a current surplus of \$6.6 million. In 2016 the System's contributions were \$161.4 million while deductions were \$158.4 million which resulted in a prior year surplus of \$3.0 million. Therefore, for these two years the System was able to sustain operations independent of investment income.

The primary change in net position over the prior year relates to each year's investment performance. Net investment income was \$189.3 million and \$74.9 million in 2017 and 2016 respectively. The annual money weighted rate of return was 17.25% and 7.35% in 2017 and 2016 respectively. The system's investment policy is designed to achieve a long-term rate of return of 7.50% and fluctuation in annual investment returns is expected.

The following tables present summarized financial information for the past two years.

	2017	2016
Assets:		
Cash.....	\$ 58,763,167	\$ 69,317,187
Investments.....	1,305,346,026	1,100,286,524
Receivables.....	9,056,556	7,408,840
Capital assets, net of accumulated depreciation....	5,353,968	5,625,313
Total assets.....	1,378,519,717	1,182,637,864
Liabilities:		
Accounts payable.....	150,658	129,806
Other.....	17,840	87,864
Total liabilities.....	168,498	217,670
Net Position Restricted for Pensions.....	\$ 1,378,351,219	1,182,420,194

	<u>2017</u>	<u>2016</u>
Additions:		
Contributions:		
Member contributions.....	\$ 44,177,815	\$ 47,097,081
Employer contributions.....	115,462,035	107,096,707
Other contributions.....	<u>10,320,943</u>	<u>7,191,133</u>
Total contributions.....	<u>169,960,793</u>	<u>161,384,921</u>
Net investment income (loss):		
Total investment income (loss).....	195,709,657	80,720,725
Less, investment expenses.....	<u>(6,366,083)</u>	<u>(5,803,179)</u>
Net investment income (loss).....	<u>189,343,574</u>	<u>74,917,546</u>
Total additions.....	<u>359,304,367</u>	<u>236,302,467</u>
Deductions:		
Administration.....	2,619,464	3,062,521
Retirement benefits, refunds and transfers.....	160,139,193	154,904,388
Building operations and maintenance.....	306,177	235,667
Depreciation.....	<u>308,508</u>	<u>162,594</u>
Total deductions.....	<u>163,373,342</u>	<u>158,365,170</u>
Net increase (decrease) in fiduciary net position....	195,931,025	77,937,297
Fiduciary net position at beginning of year.....	<u>1,182,420,194</u>	<u>1,104,482,897</u>
Fiduciary net position at end of year.....	<u>\$ 1,378,351,219</u>	<u>\$ 1,182,420,194</u>

Requests for Information

This financial report is designed to provide a general overview of the System's finances for all those with an interest in the System's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the System's Chief Administrative Officer, 25 Linnell Circle, Billerica, Massachusetts 01865.

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2017

Assets	
Cash and cash equivalents.....	\$ 58,763,167
Investments:	
Investments in Pension Reserve Investment Trust...	1,295,940,107
Other Investments.....	<u>9,405,919</u>
Total investments.....	<u>1,305,346,026</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	2,871,114
Member contributions.....	97,485
Employer pension appropriation.....	51,965
Reimbursements from other systems.....	3,896,021
Member make-up payments and redeposits.....	324,915
Other accounts receivable.....	<u>1,815,056</u>
Total Receivables.....	<u>9,056,556</u>
Capital assets, net of accumulated depreciation.....	<u>5,353,968</u>
Total Assets.....	<u>1,378,519,717</u>
Liabilities	
Accounts payable.....	150,658
Other liabilities.....	<u>17,840</u>
Total Liabilities.....	<u>168,498</u>
Net Position Restricted for Pensions.....	\$ <u>1,378,351,219</u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2017

Additions:

Contributions:	
Employer pension appropriation.....	\$ 115,377,205
Member contributions.....	44,177,815
Transfers from other systems.....	5,727,459
3(8)(c) contributions from other systems.....	3,572,503
Workers' compensation settlements.....	58,300
Federal grant reimbursements.....	26,530
Members' makeup payments and redeposits.....	820,577
Interest not refunded.....	112,658
Reimbursement of 91A overearnings.....	<u>87,746</u>
 Total contributions.....	 <u>169,960,793</u>
Net investment income:	
Investment income (loss).....	195,709,657
 Less: investment expense.....	 <u>(6,366,083)</u>
 Net investment income (loss).....	 <u>189,343,574</u>
 Total additions.....	 <u>359,304,367</u>

Deductions:

Administration.....	2,619,464
Building operations and maintenance.....	306,177
Retirement benefits and refunds.....	144,622,539
Transfers to other systems.....	5,051,691
3(8)(c) transfer to other systems.....	10,464,963
Depreciation.....	<u>308,508</u>
 Total deductions.....	 <u>163,373,342</u>
 Net increase (decrease) in fiduciary net position.....	 195,931,025
 Fiduciary net position at beginning of year.....	 <u>1,182,420,194</u>
 Fiduciary net position at end of year.....	 <u>\$ 1,378,351,219</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week. As of January 1, 2018, the System had 71 participating employers.

Instituted in 1937, the System is a member of the Massachusetts Contributory Retirement System and is governed by Chapter 32 of the Massachusetts General Laws. Membership in the Plan is mandatory immediately upon the commencement of employment for all permanent, full-time employees.

Massachusetts contributory retirement system benefits are, with certain exceptions, uniform from system to system. The System provides for retirement allowance benefits up to a maximum of 80% of a member's highest three-year average annual rate of regular compensation for those hired prior to April 2, 2012 and the highest five-year average for members hired after that date. Benefit payments are based upon a member's age, length of creditable service, level of compensation, and group classification.

Members become vested after ten years of creditable service. A superannuation retirement allowance may be received upon the completion of 20 years of service or upon reaching the age of 55 with 10 years of service. Normal retirement for most employees occurs at age 65 (except for certain hazardous duty and public safety positions, whose normal retirement is at age 55).

A retirement allowance consists of two parts: an annuity and a pension. A member's accumulated total deductions and the interest they generate constitute the annuity. The differential between the total retirement benefit and the annuity is the pension.

Active members contribute between 5% and 11% of their gross regular compensation. The percentage rate is keyed to the date upon which an employee's membership commences. These deductions are deposited in the Annuity Savings Fund and earn interest at a rate determined by the Public Employee Retirement Administration Commission's (PERAC) actuary. When a member's retirement becomes effective, his/her deductions and related interest are transferred to the Annuity Reserve Fund. Any cost-of-living adjustments granted between 1981 and 1997 and any increase in other benefits imposed by the Commonwealth of Massachusetts' state law during those years are borne by the Commonwealth and are deposited into the Pension Fund. Cost-of-living adjustments granted after 1997 must be approved by the System and all costs are borne by the System.

The pension portion of any retirement benefit is paid from the Pension Fund. The governmental unit employing the member must annually appropriate and contribute the amount of current-year pension assessment.

Administrative expenses, which were previously appropriated from the governmental entities whose employees are members of the system, are now paid from investment income.

Members who become permanently and totally disabled for further duty may be eligible to receive a disability retirement allowance. The amount of benefits to be received in such cases is dependent on several factors, including whether or not the disability is work related, the member's age, years of creditable service, level of compensation, veterans' status and group classification.

Survivor benefits are extended to eligible beneficiaries of members whose death occurs prior to or following retirement.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements of the Middlesex County Retirement System have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is the recognized standard-setting body for establishing governmental accounting and financial reporting principles.

MCRS is a special-purpose government engaged only in fiduciary activities. Accordingly, the financial statements are reported using the flow of economic resources measurement focus and use the accrual basis of accounting. Under this method, additions are recorded when earned and deductions are recorded when the liabilities are incurred.

Cash and Investments

Cash and cash equivalents are considered to be cash on hand, demand deposits and short-term investments with an original maturity of three months or less from the date of acquisition. Investments are carried at fair value. The fair values were determined by the closing price for those securities traded on national stock exchanges and at the average bid-and-asked quotation for those securities traded in the over-the-counter market. The fair value of private equities are based on management's valuation of estimates and assumptions from information and representations provided by the respective general partners, in the absence of readily ascertainable market values. Real estate assets are reported at fair value utilizing an income approach to valuation along with independent appraisals and estimates by management.

Fair Value Measurements

The System reports required types of financial instruments in accordance with the fair value standards. These standards require an entity to maximize the use of observable inputs (such as quoted prices in active markets) and minimize the use of unobservable inputs (such as appraisals or valuation techniques) to determine fair value. Fair value standards also require the government to classify these financial instruments into a three-level hierarchy, based on the priority of inputs to the valuation technique or in accordance with net asset value practical expedient rules, which allow for either Level 2 or Level 3 depending on lock up and notice periods associated with the underlying funds.

Instruments measured and reported at fair value are classified and disclosed in one of the following categories:

Level 1 – Quoted prices are available in active markets for identical instruments as of the reporting date. Instruments, which are generally included in this category, include actively traded equity and debt securities, U.S. government obligations, and mutual funds with quoted market prices in active markets.

Level 2 – Pricing inputs are other than quoted in active markets, which are either directly or indirectly observable as of the reporting date, and fair value is determined through the use of models or other valuation methodologies. Certain fixed income securities, primarily corporate bonds, are classified as Level 2 because fair values are estimated using pricing models, matrix pricing, or discounted cash flows.

Level 3 – Pricing inputs are unobservable for the instrument and include situations where there is little, if any, market activity for the instrument. The inputs into the determination of fair value require significant management judgment or estimation.

In some instances the inputs used to measure fair value may fall into different levels of the fair value hierarchy and is based on the lowest level of input that is significant to the fair value measurement.

Market price is affected by a number of factors, including the type of instrument and the characteristics specific to the instrument. Instruments with readily available active quoted prices generally will have a higher degree of market price observability and a lesser degree of judgment used in measuring fair value. It is reasonably possible that change in values of these instruments will occur in the near term and that such changes could materially affect amounts reported in these financial statements. For more information on the fair value of the System's financial instruments, see Note 5 – Cash and Investments.

Accounts Receivable

Accounts receivable consist of member deductions, pension fund appropriations, and other miscellaneous reimbursements. These receivables are considered 100% collectible and therefore do not report an allowance for uncollectibles.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of fiduciary net position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents a consumption of fiduciary net position that applies to a future period(s) and so will not be recognized as an outflow of resources (deduction) until then. The MCRS did not have any items that qualify for reporting in this category.

In addition to liabilities, the statement of fiduciary net position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources*, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (addition) until that time. The MCRS did not have any items that qualify for reporting in this category.

NOTE 3 – PLAN ADMINISTRATION

The System is administered by a five-person Board of Retirement consisting of a first member, who shall serve as Chairman/Treasurer, who shall be appointed by the other four members, a second member elected by the Advisory Council consisting of representatives from the member units, a third and fourth member who shall be elected by the members in or retired from the service of such system, and a fifth member who shall be chosen by the other four members.

Chairman	Thomas F. Gibson	Term Expires:	12/31/2020
Advisory Council Member	Brian P. Curtin	Term Expires:	12/31/2018
Elected Member	John Brown	Term Expires:	12/31/2020
Elected Member	Joseph W. Kearns	Term Expires:	12/31/2019
Appointed Member	Robert Healy	Term Expires:	12/17/2020

Board members are required to meet at least once a month. The Board must keep a record of all of its proceedings. The Board must annually submit to the appropriate authority an estimate of the expenses of administration and cost of operation of the System. The Board must annually file a financial statement of condition for the System with the Executive Director of PERAC.

The investment of the System's funds is the responsibility of the Board. All retirement allowances must be

approved by the Retirement Board. The PERAC Actuary performs verification prior to payment, unless the System has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the System must be approved by a majority vote of the Board. Payments shall be made only upon vouchers signed by three persons designated by the Board.

The following retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts as follows:

Treasurer-Custodian:) \$10,000,000 Fiduciary
 Ex-Officio Member:) RLI Insurance Company
 Elected Members:)
 Appointed Members:) \$1,000,000 Fidelity
 Staff Employees:) National Union Fire Insurance

NOTE 4 – OFFICE BUILDING

The MCRS owns an office building that was purchased as an investment and for the administrative offices of the System. The building is a two story, 1986-built office building consisting of 62,307 square feet of net rentable area. The property is situated on a 4.23 acre site in Billerica, Middlesex County, Massachusetts

NOTE 5 – CASH AND INVESTMENTS

Custodial Credit Risk - Deposits

At December 31, 2017, the carrying amount of the System’s deposits totaled \$37,962,772, and the bank balance totaled \$39,761,801, all of which was covered by Federal Depository Insurance.

Investments

The System’s investments are as follows:

<u>Investment Type</u>	December 31, 2017
PRIT Pooled Funds.....	\$ 1,295,940,107
Money Market Mutual Funds.....	20,800,395
Pooled Alternative Investments...	6,432,162
Pooled Real Estate Funds.....	2,973,757
Total Investments.....	\$ 1,326,146,421

Approximately 98% of the Retirement System’s investments are in Pension Reserve Investment Trust (PRIT). This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board. The fair values of the positions in each investment Pool are the same as the value of each Pool’s shares. The Administration does not have the ability to control any of the investment decisions relative to its funds in PRIT.

Approximately 1% of the System's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 1% of the System's funds are invested in money market mutual funds. The market values of assets in those funds are valued using prices quoted in active markets for those securities.

The Administration's annual money-weighted rate of return on pension plan investments was 17.25%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Market Value of Investments

The retiree pension defined benefit plan holds significant amounts of investments that are measured at fair value on a recurring basis. Because investing is a key part of the plan's activities, the plan shows greater disaggregation in its disclosures. The plan chooses a tabular format for disclosing the levels within the fair value hierarchy.

The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles.

The System has the following recurring fair value measurements as of December 31, 2017:

Investment Type	12/31/2017	Fair Value Measurements Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level.....				
<u>Other Investments</u>				
Money Market Mutual Funds.....	\$ 20,800,395	\$ 20,800,395	\$ -	\$ -
Pooled Alternative Investments.....	6,432,162	-	-	6,432,162
Pooled Real Estate Funds.....	2,973,757	-	-	2,973,757
Total Investments by fair value level.....	30,206,314	\$ 20,800,395	\$ -	\$ 9,405,919
Investments measured at the net asset value (NAV)...				
PRIT Investments.....	1,295,940,107			
Total Investments.....	\$ 1,326,146,421			

Money Market Mutual Funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled Alternative Investments and Pooled Real Estate Funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method. This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board (PRIM). The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The System does not have the ability to control any of the investment decisions relative to its funds in PRIT.

NOTE 6 – CAPITAL ASSETS

Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements....	40
Pick-up truck.....	5
PTG Software.....	5

Capital asset activity for the year ended December 31, 2017, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
Construction in progress.....	729,570	-	(729,570)	-
Total capital assets not being depreciated.....	1,402,227	-	(729,570)	672,657
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,086,623	6,250	-	1,092,873
Vehicles.....	19,603	30,913	-	50,516
PTG Software.....	-	729,570	-	729,570
Total capital assets being depreciated.....	6,523,362	766,733	-	7,290,095
<u>Less accumulated depreciation for:</u>				
Buildings.....	(1,900,354)	(135,428)	-	(2,035,782)
Building improvements.....	(380,319)	(27,166)	-	(407,485)
Vehicles.....	(19,603)	-	-	(19,603)
PTG Software.....	-	(145,914)	-	(145,914)
Total accumulated depreciation.....	(2,300,276)	(308,508)	-	(2,608,784)
Total capital assets being depreciated, net.....	4,223,086	458,225	-	4,681,311
Total capital assets, net.....	\$ 5,625,313	\$ 458,225	\$ (729,570)	\$ 5,353,968

NOTE 7 – MEMBERSHIP

The following table represents the System's membership at December 31, 2017:

	<u>2017</u>
Active members.....	9,283
Inactive members.....	3,110
Disabled members.....	434
Retirees and beneficiaries currently receiving benefits.....	<u>5,063</u>
Total.....	<u>17,890</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2017, were as follows:

Total pension liability.....	\$ 2,797,535,970
The pension plan's fiduciary net position.....	<u>1,378,351,219</u>
The net pension liability.....	<u>\$ 1,419,184,751</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	49.27%

The total pension liability was determined by an actuarial valuation as of January 1, 2018, using the following actuarial assumptions, applied to all periods included in the measurement that was updated back to December 31, 2017:

Valuation date.....	January 1, 2018
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.5% for fiscal 2018 through fiscal 2024, 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, 2018, 1 year remaining for 2002 ERI liability, 2 years remaining for 2003 ERI liability, 4 years remaining for 2010 ERI liability, and 17 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.
Inflation rate.....	3.25% (previously 3.5%)

Projected salary increases.....	Varies by length of service with ultimate rates of 4.00% for Group 1, 4.25% for Group 2 and 4.50% for Group 4
Cost of living adjustments.....	3.0% of the first \$14,000 of retirement income.
Rates of retirement.....	Varies based upon age for general employees, police and fire employees.
Rates of disability.....	For general employees, it was assumed that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).
Mortality Rates:	
Pre-Retirement.....	The RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2017.
Healthy Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2017.
Disabled Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year and projected generationally with Scale MP-2017.
Investment rate of return/Discount rate.....	7.50%, net of pension plan investment expense, including inflation previously 7.75%

Investment policy: The pension plan's policy in regard to the allocation of invested assets is established by PRIT. Plan assets are managed on a total return basis with a long-term objective of achieving a fully funded status for the benefits provided through the pension plan.

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 January 1, 2018, are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return	Long-Term Expected Asset Allocation
Domestic equity.....	6.15%	17.50%
International developed markets equity.....	7.11%	15.50%
International emerging markets equity.....	9.41%	6.00%
Core fixed income.....	1.68%	12.00%
High-yield fixed income.....	4.13%	10.00%
Real estate.....	4.90%	10.00%
Commodities.....	4.71%	4.00%
Hedge funds, GTAA, Risk parity.....	3.94%	13.00%
Private equity.....	10.28%	12.00%
		100.00%

Discount rate: The discount rate used to measure the total pension liability was 7.50%. 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 rate. 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 position liability to changes in the discount rate. The following presents the net position liability, calculated using the discount rate of 7.50%, as well as what the net position liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.50%) or 1-percentage-point higher (7.50% than the current rate:

	1% Decrease (6.50%)	Current Discount (7.50%)	1% Increase (8.50%)
Middlesex County Retirement System's net pension liability as of December 31, 2017.....	\$ 1,741,812,266	\$ 1,419,184,751	\$ 1,147,166,823

Contributions: Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The pension fund appropriations are allocated amongst employers based on the actuarial valuation.

NOTE 9 – DISPUTE WITH THE COMMONWEALTH AND STATE EMPLOYEES RETIREMENT SYSTEM

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County be transferred to the Commonwealth. Therefore, the MCRS was required to transfer the Annuity Savings Fund Balances of these transferred County employees to the State Employees Retirement System (SERS). This transfer, totaling approximately \$18 million, was made during calendar year 1998.

In December of 1999, the State Legislature enacted Massachusetts General Law, Chapter 34B (Abolition of County Government). This legislation, among other things, defines the components of determining the overall surplus or deficit of an abolished County upon transfer to the Commonwealth and how regional retirement systems will be affected. Sections 8 and 18 addressed how the abolished County's unfunded liabilities in regional retirement systems will be paid for. The MCRS believes, as a result of the abolishment of Middlesex County, that the Commonwealth of Massachusetts owed them \$9,501,680 for the Unfunded Liability for retirees of the former Middlesex County.

The Commonwealth and SERS did not agree with the assertion that the MCRS was owed \$9,501,680. As a result, the MCRS acted to stop 3(8)(c) reimbursements to the State Employees Retirement System and correspondingly the State System began to intercept all COLA reimbursements which were due the MCRS. In 2012 the MCRS reinstated payments for 3(8)(c) reimbursements to the SERS. The SERS and MCRS have agreed upon the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld; however, a final payment to resolve the issue has yet to be made.

The net amount of these transactions is not considered significant and has not been reported in these financial statements.

NOTE 10 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

During 2017, the following GASB pronouncements were implemented:

- GASB Statement #78, *Pensions Provided through Certain Multiple-Employer Defined Benefit Pension Plans*. This pronouncement did not impact the basic financial statements.
- GASB Statement #82, *Pension Issues – an amendment of GASB Statements #67, #68, and #73*. The basic financial statements and related notes were updated to be in compliance with this pronouncement.

The following GASB pronouncements will be implemented in the future:

- The GASB issued Statement #83, *Certain Asset Retirement Obligations*, which is required to be implemented in 2019.
- The GASB issued Statement #84, *Fiduciary Activities*, which is required to be implemented in 2020.
- The GASB issued Statement #85, *Omnibus 2017*, which is required to be implemented in 2018.
- The GASB issued Statement #86, *Certain Debt Extinguishment Issues*, which is required to be implemented in 2018.
- The GASB issued Statement #87, *Leases*, which is required to be implemented in 2021.

Management is currently assessing the impact the implementation of these pronouncements will have on the basic financial statements.

NOTE 11 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through August 7, 2018, which is the date the financial statements were available to be issued.

Required Supplementary Information

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
AND RELATED RATIOS**

	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017
Total pension liability:				
Service cost.....	\$ 52,132,389	\$ 54,217,685	\$ 56,386,392	\$ 60,585,598
Interest.....	172,094,226	179,703,272	187,359,946	200,298,121
Changes in benefit terms.....	-	-	-	-
Differences between expected and actual experience.....	-	-	7,976,453	(9,059,393)
Changes in assumptions.....	-	-	96,500,754	97,195,824
Benefit payments.....	<u>(125,082,678)</u>	<u>(134,295,504)</u>	<u>(143,428,636)</u>	<u>(150,780,931)</u>
Net change in total pension liability.....	99,143,937	99,625,453	204,794,909	198,239,219
Total pension liability - beginning.....	<u>2,195,732,452</u>	<u>2,294,876,389</u>	<u>2,394,501,842</u>	<u>2,599,296,751</u>
Total pension liability - ending (a).....	<u>\$ 2,294,876,389</u>	<u>\$ 2,394,501,842</u>	<u>\$ 2,599,296,751</u>	<u>\$ 2,797,535,970</u>
Plan fiduciary net position:				
Employer pension appropriation.....	\$ 93,368,685	\$ 99,792,641	\$ 107,032,211	\$ 115,377,205
Member contributions.....	39,048,869	40,340,741	42,015,296	44,177,815
Other contributions.....	6,405,881	8,668,378	12,337,414	10,405,773
Net investment income (loss).....	74,904,315	7,732,128	74,917,546	189,343,574
Administrative expenses.....	(2,996,390)	(2,824,803)	(3,062,521)	(2,619,464)
Building operations and maintenance.....	(381,899)	(302,771)	(235,667)	(306,177)
Retirement benefits and refunds.....	(125,082,678)	(134,295,504)	(143,428,636)	(150,780,931)
Other retirement deductions.....	(5,556,930)	(8,025,993)	(11,475,752)	(9,358,262)
Depreciation.....	<u>(162,594)</u>	<u>(162,594)</u>	<u>(162,594)</u>	<u>(308,508)</u>
Net increase (decrease) in fiduciary net position.....	79,547,259	10,922,223	77,937,297	195,931,025
Fiduciary net position - beginning of year.....	<u>1,014,013,415</u>	<u>1,093,560,674</u>	<u>1,104,482,897</u>	<u>1,182,420,194</u>
Fiduciary net position - end of year (b).....	<u>\$ 1,093,560,674</u>	<u>\$ 1,104,482,897</u>	<u>\$ 1,182,420,194</u>	<u>\$ 1,378,351,219</u>
Net pension liability - ending (a)-(b).....	<u>\$ 1,201,315,715</u>	<u>\$ 1,290,018,945</u>	<u>\$ 1,416,876,557</u>	<u>\$ 1,419,184,751</u>
Plan fiduciary net position as a percentage of the total pension liability.....	47.65%	46.13%	45.49%	49.27%
Covered-employee payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322	\$ 451,777,105
Net pension liability as a percentage of covered payroll.....	288.95%	298.35%	322.28%	314.13%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

SCHEDULE OF CONTRIBUTIONS

	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017
Actuarially determined contribution.....	\$ 92,826,743	\$ 98,792,642	\$ 105,246,797	\$ 112,017,087
Contributions in relation to the actuarially determined contribution.....	<u>(93,400,946)</u>	<u>(99,820,481)</u>	<u>(107,067,707)</u>	<u>(115,426,815)</u>
Contribution deficiency (excess).....	<u>\$ (574,203)</u>	<u>\$ (1,027,839)</u>	<u>\$ (1,820,910)</u>	<u>\$ (3,409,728)</u>
Covered payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322	\$ 451,777,105
Contributions as a percentage of covered payroll.....	22.47%	23.09%	24.35%	25.55%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

SCHEDULE OF INVESTMENT RETURNS

<u>Year</u>	<u>Annual money-weighted rate of return, net of investment expense</u>
December 31, 2017	17.25%
December 31, 2016	7.35%
December 31, 2015	0.61%
December 31, 2014	7.54%

Note: this schedule is intended to present information for 10 years. Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

NOTE A – CHANGES IN THE NET PENSION LIABILITY AND RELATED RATIOS

The Schedule of Changes in the Net Pension Liability and Related Ratios includes the detailed changes in the system's total pension liability, changes in the system's net position, and the ending net pension liability. It also demonstrates the plan's net position as a percentage of the total pension liability and the net pension liability as a percentage of covered payroll.

NOTE B – CONTRIBUTIONS

Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The total appropriations are payable on July 1 and January 1. Employers may choose to pay the entire appropriation in July at a discounted rate. Accordingly, actual employer contributions may be less than the "total appropriation". The pension fund appropriations are allocated amongst employers based on the actuarial valuation results. In addition, an employer may contribute more than the amount required.

NOTE C – MONEY WEIGHTED RATE OF RETURN

The money weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. A money weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested. Inputs to the money weighted rate of return calculation are determined monthly.

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONSChanges in Assumptions

The following assumption changes were reflected in the January 1, 2018 actuarial valuation:

- The mortality tables for healthy participants were changed from the RP-2000 Employee and Healthy Annuitant Mortality Tables projected generationally using Scale BB2D from 2009 to the RP-2014 Blue Collar Employee and Healthy Annuitant Mortality Tables projected generationally using Scale MP-2017.
- The mortality tables for disabled participants were changed from the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale BB2D from 2015 to the RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward 1 year projected generationally using Scale MP-2017.
- The long-term salary increase assumption was lowered by 0.25%, to 4.00% for Group 1 participants, 4.25% for Group 2 participants, and 4.50% for Group 4 participants.
- The investment rate of return assumption was reduced from 7.75% to 7.50%.
- The inflation rate was reduced to 3.25% from the previous rate of 3.50%.

Changes in Plan Provisions

None.

Audit of Specific Elements, Accounts and Items of Financial Statements

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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

We have audited the accompanying schedule of employer allocations of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2017, and the related notes. We have also audited the total for all entities of the rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total pension expense and contributions included in the accompanying schedule of pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2017, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and total for all rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total pension expense and contributions for the total of all participating entities for the Middlesex County Retirement System as of and for the year ended December 31, 2017, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the Middlesex County Retirement System as of and for the year ended December 31, 2017, and our report thereon, dated August 7, 2018, expressed an unmodified opinion on those financial statements.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System management, the Middlesex County Retirement System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.



August 7, 2018

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2017

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	48,182,609	3.395091%
Town of Ashby.....	1,780,532	0.125462%
Town of Ashland.....	32,308,841	2.276578%
Town of Ayer.....	17,999,043	1.268266%
Town of Bedford.....	49,661,979	3.499331%
Town of Billerica.....	140,303,356	9.886194%
Town of Boxborough.....	10,225,882	0.720546%
Town of Burlington.....	117,368,093	8.270107%
Town of Carlisle.....	9,435,767	0.664872%
Town of Chelmsford.....	103,993,778	7.327712%
Town of Dracut.....	60,106,114	4.235256%
Town of Dunstable.....	2,563,856	0.180657%
Town of Groton.....	21,402,700	1.508098%
Town of Holliston.....	23,773,972	1.675185%
Town of Hopkinton.....	20,653,839	1.455331%
Town of Hudson.....	63,161,014	4.450514%
Town of Lincoln.....	24,841,810	1.750428%
Town of Littleton.....	21,432,789	1.510218%
Town of North Reading.....	48,035,495	3.384725%
Town of Pepperell.....	16,341,195	1.151449%
Town of Sherborn.....	10,500,304	0.739883%
Town of Shirley.....	8,406,745	0.592364%
Town of Stow.....	10,459,477	0.737006%
Town of Sudbury.....	58,772,716	4.141301%
Town of Tewksbury.....	98,006,180	6.905808%
Town of Townsend.....	8,090,096	0.570052%
Town of Tyngsborough.....	20,897,452	1.472497%
Town of Wayland.....	53,697,606	3.783694%
Town of Westford.....	51,698,881	3.642856%
Town of Weston.....	61,375,790	4.324722%
Town of Wilmington.....	83,422,615	5.878207%
Acton-Boxborough Regional School District.....	27,084,083	1.908425%
Acton Water Supply.....	3,370,594	0.237502%
Bedford Housing Authority.....	313,455	0.022087%
Billerica Housing Authority.....	1,359,538	0.095797%
Chelmsford Housing Authority.....	2,029,608	0.143012%
Chelmsford Water District.....	391,160	0.027562%
Dracut Housing Authority.....	2,055,364	0.144827%
Dracut Water Supply.....	3,031,987	0.213643%
East Chelmsford Water District.....	317,151	0.022347%
East Middlesex Mosquito Control.....	509,331	0.035889%
Greater Lowell Regional Vocational Technical School District.....	15,814,520	1.100246%
Groton-Dunstable Regional School District.....	10,714,454	0.754972%
Hudson Housing Authority.....	1,155,540	0.081423%
Lincoln-Sudbury Regional School District.....	8,466,429	0.596570%
Nashoba Valley Technical High School District.....	3,512,891	0.247529%
North Chelmsford Water District.....	814,336	0.057381%
North Middlesex Regional School District.....	11,610,214	0.818090%
Shawsheen Valley Regional Vocational School.....	7,940,619	0.559520%
South Middlesex Regional Vocational Technical School.....	6,492,906	0.457510%
Sudbury Water District.....	1,701,694	0.119906%
Tewksbury Housing Authority.....	1,527,710	0.107647%
Wayland Housing Authority.....	611,202	0.043067%
Hopkinton Housing Authority.....	458,176	0.032284%
Sudbury Housing Authority.....	436,617	0.030765%
Wilmington Housing Authority.....	335,690	0.023654%
Acton Housing Authority.....	741,792	0.052269%
Burlington Housing Authority.....	56,771	0.004000%
Ayer Housing Authority.....	792,328	0.055830%
Holliston Housing Authority.....	142,446	0.010037%
Littleton Housing Authority.....	465,317	0.032788%
Westford Housing Authority.....	517,839	0.036488%
Shirley Water District.....	335,341	0.023629%
Tyngsborough Housing Authority.....	496,440	0.034981%
Pepperell Housing Authority.....	175,037	0.012334%
Groton Housing Authority.....	(15,094)	-0.001064%
Tyngsborough Water District.....	380,399	0.026804%
North Reading Housing Authority.....	139,940	0.009861%
West Groton Water.....	21,871	0.001541%
Ayer-Shirley Regional School District.....	4,178,529	0.294432%
Total.....	\$ 1,419,184,751	100.0000%

See notes to schedule of employer allocations and schedule of pension amounts by employer.

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability.....	\$ -	\$ -	\$ -	45,680,759
Ending net pension liability.....	\$ -	\$ -	\$ -	48,182,609
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	162,485
Changes of assumptions.....	-	-	-	4,605,682
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	1,863,631
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	6,631,798
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	246,059
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	1,308,731
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	2,016,011
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	3,570,801
Pension Expense				
Proportionate share of plan pension expense.....	\$ 345,861	\$ -	\$ -	5,606,949
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(160,007)
Total Employer Pension Expense.....	\$ 345,861	\$ -	\$ -	5,446,942
Contributions				
Statutory required contribution.....	\$ 345,861	\$ -	\$ -	3,454,129
Contribution in relation to statutory required contribution.....	(345,861)	-	-	(3,454,129)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	-
Contributions as a percentage of covered payroll.....	29.21%	0.00%	0.00%	24.51%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ -	\$ -	\$ -	1,133,445
June 30, 2020.....	-	-	-	1,099,000
June 30, 2021.....	-	-	-	548,766
June 30, 2022.....	-	-	-	279,786
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	3,060,997
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ -	\$ -	\$ -	59,136,110
Current discount rate (7.50%).....	\$ -	\$ -	\$ -	48,182,609
1% increase (8.50%).....	\$ -	\$ -	\$ -	38,947,361
Covered Payroll.....	\$ 1,184,239	\$ -	\$ -	14,091,030

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability.....	\$ 1,387,848	\$ 31,797,911	\$ 17,032,643	\$ 50,282,391
Ending net pension liability.....	\$ 1,780,532	\$ 32,308,841	\$ 17,999,043	\$ 49,661,979
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 6,004	\$ 108,954	\$ 60,698	\$ 167,473
Changes of assumptions.....	170,198	3,088,340	1,720,493	4,747,091
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	368,886	1,951,990	827,225	41,749
Total Deferred Outflows of Resources.....	\$ 545,088	\$ 5,149,284	\$ 2,608,416	\$ 4,956,313
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 9,093	\$ 164,995	\$ 91,918	\$ 253,615
Net difference between projected and actual investment earnings on pension plan investments.....	48,363	877,569	488,887	1,348,912
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	197,985	-	975,971	1,563,207
Total Deferred Inflows of Resources.....	\$ 255,441	\$ 1,042,564	\$ 1,556,776	\$ 3,165,734
Pension Expense				
Proportionate share of plan pension expense.....	\$ 207,194	\$ 3,759,736	\$ 2,094,532	\$ 5,779,113
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	40,847	661,243	(88,526)	(462,196)
Total Employer Pension Expense.....	\$ 248,041	\$ 4,420,979	\$ 2,006,006	\$ 5,316,917
Contributions				
Statutory required contribution.....	\$ 147,365	\$ 2,757,454	\$ 1,363,375	\$ 3,920,935
Contribution in relation to statutory required contribution.....	(147,365)	(2,787,173)	(1,363,375)	(3,920,935)
Contribution deficiency/(excess).....	\$ -	\$ (29,719)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	13.37%	21.94%	21.46%	20.82%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 88,645	\$ 1,528,568	\$ 394,655	\$ 870,969
June 30, 2020.....	87,370	1,505,477	381,790	835,482
June 30, 2021.....	45,336	1,000,753	150,347	299,117
June 30, 2022.....	68,296	71,922	124,848	(214,989)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 289,647	\$ 4,106,720	\$ 1,051,640	\$ 1,790,579
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 2,185,313	\$ 39,653,715	\$ 22,090,813	\$ 60,951,777
Current discount rate (7.50%).....	\$ 1,780,532	\$ 32,308,841	\$ 17,999,043	\$ 49,661,979
1% increase (8.50%).....	\$ 1,439,258	\$ 26,116,148	\$ 14,549,127	\$ 40,143,164
Covered Payroll.....	\$ 1,102,061	\$ 12,705,217	\$ 6,354,563	\$ 18,836,700

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability.....	\$ 143,712,635	\$ 9,977,149	\$ 114,929,674	\$ 9,988,584
Ending net pension liability.....	\$ 140,303,356	\$ 10,225,882	\$ 117,368,093	\$ 9,435,767
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 473,141	\$ 34,484	\$ 395,797	\$ 31,820
Changes of assumptions.....	13,411,327	977,472	11,218,990	901,946
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,146,060	841,716	1,664,683	392,933
Total Deferred Outflows of Resources.....	\$ 16,030,528	\$ 1,853,672	\$ 13,279,470	\$ 1,326,699
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 716,503	\$ 52,222	\$ 599,377	\$ 48,187
Net difference between projected and actual investment earnings on pension plan investments.....	3,810,902	277,754	3,187,938	256,293
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,542,749	78,222	1,005,173	408,850
Total Deferred Inflows of Resources.....	\$ 9,070,154	\$ 408,198	\$ 4,792,488	\$ 713,330
Pension Expense				
Proportionate share of plan pension expense.....	\$ 16,326,922	\$ 1,189,977	\$ 13,657,971	\$ 1,098,035
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(684,453)	249,159	70,770	47,804
Total Employer Pension Expense.....	\$ 15,642,469	\$ 1,439,136	\$ 13,728,741	\$ 1,145,839
Contributions				
Statutory required contribution.....	\$ 10,782,713	\$ 791,841	\$ 8,877,933	\$ 877,464
Contribution in relation to statutory required contribution.....	(10,790,894)	(791,841)	(8,877,933)	(877,464)
Contribution deficiency/(excess).....	\$ (8,181)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	33.08%	27.84%	27.41%	17.07%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 3,081,964	\$ 523,671	\$ 3,221,494	\$ 301,105
June 30, 2020.....	2,981,694	516,360	3,137,616	294,364
June 30, 2021.....	1,859,375	385,087	2,011,235	110,493
June 30, 2022.....	(962,659)	20,356	116,637	(92,593)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 6,960,374	\$ 1,445,474	\$ 8,486,982	\$ 613,369
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 172,198,957	\$ 12,550,559	\$ 144,049,756	\$ 11,580,822
Current discount rate (7.50%).....	\$ 140,303,356	\$ 10,225,882	\$ 117,368,093	\$ 9,435,767
1% increase (8.50%).....	\$ 113,411,149	\$ 8,265,865	\$ 94,871,935	\$ 7,627,191
Covered Payroll.....	\$ 32,623,751	\$ 2,844,512	\$ 32,393,793	\$ 5,141,785

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability.....	\$ 100,190,226	\$ 57,818,789	\$ 2,199,339	\$ 22,421,400
Ending net pension liability.....	\$ 103,993,778	\$ 60,106,114	\$ 2,563,856	\$ 21,402,700
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 350,695	\$ 202,694	\$ 8,646	\$ 72,176
Changes of assumptions.....	9,940,564	5,745,426	245,074	2,045,842
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,618,126	1,757,566	323,309	334,544
Total Deferred Outflows of Resources.....	\$ 12,909,385	\$ 7,705,686	\$ 577,029	\$ 2,452,562
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 531,077	\$ 306,951	\$ 13,093	\$ 109,300
Net difference between projected and actual investment earnings on pension plan investments.....	2,824,665	1,632,594	69,639	581,337
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,980,299	394,812	220,949	985,825
Total Deferred Inflows of Resources.....	\$ 5,336,041	\$ 2,334,357	\$ 303,681	\$ 1,676,462
Pension Expense				
Proportionate share of plan pension expense.....	\$ 12,101,626	\$ 6,994,484	\$ 298,352	\$ 2,490,610
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(79,532)	347,199	16,940	(180,917)
Total Employer Pension Expense.....	\$ 12,022,094	\$ 7,341,683	\$ 315,292	\$ 2,309,693
Contributions				
Statutory required contribution.....	\$ 7,822,651	\$ 4,506,526	\$ 206,969	\$ 1,966,279
Contribution in relation to statutory required contribution.....	(8,022,651)	(4,506,526)	(206,969)	(1,966,279)
Contribution deficiency/(excess).....	\$ (200,000)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	32.02%	30.70%	17.18%	27.17%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 2,712,161	\$ 1,960,736	\$ 85,766	\$ 393,634
June 30, 2020.....	2,637,839	1,917,780	83,933	378,341
June 30, 2021.....	1,793,152	1,254,246	42,499	176,645
June 30, 2022.....	430,192	238,567	61,150	(172,520)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 7,573,344	\$ 5,371,329	\$ 273,348	\$ 776,100
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 127,635,004	\$ 73,770,209	\$ 3,146,706	\$ 26,268,236
Current discount rate (7.50%).....	\$ 103,993,778	\$ 60,106,114	\$ 2,563,856	\$ 21,402,700
1% increase (8.50%).....	\$ 84,061,092	\$ 48,585,452	\$ 2,072,437	\$ 17,300,400
Covered Payroll.....	\$ 25,052,394	\$ 14,681,016	\$ 1,204,830	\$ 7,236,359

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability.....	\$ 24,188,374	\$ 21,332,499	\$ 62,417,388	\$ 25,563,964
Ending net pension liability.....	\$ 23,773,972	\$ 20,653,839	\$ 63,161,014	\$ 24,841,810
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 80,172	\$ 69,650	\$ 212,996	\$ 83,773
Changes of assumptions.....	2,272,508	1,974,260	6,037,439	2,374,580
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	558,362	1,005,346	578,603	120,389
Total Deferred Outflows of Resources.....	\$ 2,911,042	\$ 3,049,256	\$ 6,829,038	\$ 2,578,742
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 121,409	\$ 105,475	\$ 322,552	\$ 126,863
Net difference between projected and actual investment earnings on pension plan investments.....	645,745	560,997	1,715,571	674,750
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,112,223	556,184	169,818	782,893
Total Deferred Inflows of Resources.....	\$ 1,879,377	\$ 1,222,656	\$ 2,207,941	\$ 1,584,506
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,766,550	\$ 2,403,466	\$ 7,349,972	\$ 2,890,816
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(129,571)	275,087	124,386	(156,765)
Total Employer Pension Expense.....	\$ 2,636,979	\$ 2,678,553	\$ 7,474,358	\$ 2,734,051
Contributions				
Statutory required contribution.....	\$ 2,056,036	\$ 1,984,635	\$ 5,016,882	\$ 2,015,466
Contribution in relation to statutory required contribution.....	(2,132,624)	(1,984,635)	(5,016,882)	(2,015,466)
Contribution deficiency/(excess).....	\$ (76,588)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	20.63%	14.27%	23.48%	20.70%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 508,637	\$ 829,535	\$ 1,819,931	\$ 510,108
June 30, 2020.....	491,646	814,779	1,774,791	492,352
June 30, 2021.....	104,296	276,575	1,018,043	162,574
June 30, 2022.....	(72,914)	(94,289)	8,332	(170,798)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,031,665	\$ 1,826,600	\$ 4,621,097	\$ 994,236
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 29,178,578	\$ 25,349,134	\$ 77,519,599	\$ 30,489,170
Current discount rate (7.50%).....	\$ 23,773,972	\$ 20,653,839	\$ 63,161,014	\$ 24,841,810
1% increase (8.50%).....	\$ 19,217,167	\$ 16,695,074	\$ 51,054,820	\$ 20,080,329
Covered Payroll.....	\$ 10,339,394	\$ 13,910,712	\$ 21,363,646	\$ 9,736,776

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability.....	\$ 23,959,114	\$ 47,493,109	\$ 16,537,163	\$ 10,736,551
Ending net pension liability.....	\$ 21,432,789	\$ 48,035,495	\$ 16,341,195	\$ 10,500,304
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 72,277	\$ 161,989	\$ 55,107	\$ 35,410
Changes of assumptions.....	2,048,718	4,591,620	1,562,022	1,003,704
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,558,410	334,082	1,450,402	144,137
Total Deferred Outflows of Resources.....	\$ 4,679,405	\$ 5,087,691	\$ 3,067,531	\$ 1,183,251
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 109,453	\$ 245,308	\$ 83,451	\$ 53,623
Net difference between projected and actual investment earnings on pension plan investments.....	582,154	1,304,734	443,857	285,208
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,843,015	939,537	319,560	459,464
Total Deferred Inflows of Resources.....	\$ 2,534,622	\$ 2,489,579	\$ 846,868	\$ 798,295
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,494,113	\$ 5,589,829	\$ 1,901,611	\$ 1,221,905
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	338,455	(239,033)	413,751	(86,180)
Total Employer Pension Expense.....	\$ 2,832,568	\$ 5,350,796	\$ 2,315,362	\$ 1,135,725
Contributions				
Statutory required contribution.....	\$ 2,054,283	\$ 3,623,078	\$ 1,254,044	\$ 916,985
Contribution in relation to statutory required contribution.....	(3,555,064)	(3,627,495)	(1,254,044)	(916,985)
Contribution deficiency/(excess).....	\$ (1,500,781)	\$ (4,417)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	30.42%	28.78%	27.99%	23.15%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 913,814	\$ 1,050,471	\$ 852,427	\$ 195,699
June 30, 2020.....	898,493	1,016,145	840,753	188,198
June 30, 2021.....	458,993	566,919	603,981	47,825
June 30, 2022.....	(126,517)	(35,423)	(76,498)	(46,766)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 2,144,783	\$ 2,598,112	\$ 2,220,663	\$ 384,956
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 26,305,162	\$ 58,955,555	\$ 20,056,080	\$ 12,887,373
Current discount rate (7.50%).....	\$ 21,432,789	\$ 48,035,495	\$ 16,341,195	\$ 10,500,304
1% increase (8.50%).....	\$ 17,324,720	\$ 38,828,442	\$ 13,209,041	\$ 8,487,692
Covered Payroll.....	\$ 11,686,136	\$ 12,602,469	\$ 4,479,949	\$ 3,961,023

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability.....	\$ 8,912,285	\$ 10,493,658	\$ 58,372,784	\$ 93,491,923
Ending net pension liability.....	\$ 8,406,745	\$ 10,459,477	\$ 58,772,716	\$ 98,006,180
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 28,350	\$ 35,272	\$ 198,197	\$ 330,503
Changes of assumptions.....	803,584	999,801	5,617,969	9,368,220
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	111,480	214,065	1,658,187	3,136,289
Total Deferred Outflows of Resources.....	\$ 943,414	\$ 1,249,138	\$ 7,474,353	\$ 12,835,012
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 42,932	\$ 53,415	\$ 300,141	\$ 500,499
Net difference between projected and actual investment earnings on pension plan investments.....	228,343	284,099	1,596,376	2,662,030
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	971,642	83,267	1,190,337	1,135,255
Total Deferred Inflows of Resources.....	\$ 1,242,917	\$ 420,781	\$ 3,086,854	\$ 4,297,784
Pension Expense				
Proportionate share of plan pension expense.....	\$ 978,288	\$ 1,217,159	\$ 6,839,316	\$ 11,404,870
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(263,016)	52,745	14,881	327,598
Total Employer Pension Expense.....	\$ 715,272	\$ 1,269,904	\$ 6,854,197	\$ 11,732,468
Contributions				
Statutory required contribution.....	\$ 755,576	\$ 826,612	\$ 4,185,908	\$ 7,504,649
Contribution in relation to statutory required contribution.....	(755,576)	(826,612)	(4,191,182)	(7,504,649)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (5,274)	\$ -
Contributions as a percentage of covered payroll.....	44.61%	23.12%	26.41%	34.43%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ (37,339)	\$ 333,528	\$ 1,592,623	\$ 2,958,555
June 30, 2020.....	(43,346)	326,052	1,550,621	2,888,515
June 30, 2021.....	(128,741)	196,539	1,024,670	2,128,701
June 30, 2022.....	(90,077)	(27,762)	219,585	561,457
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (299,503)	\$ 828,357	\$ 4,387,499	\$ 8,537,228
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 10,317,869	\$ 12,837,261	\$ 72,133,689	\$ 120,286,211
Current discount rate (7.50%).....	\$ 8,406,745	\$ 10,459,477	\$ 58,772,716	\$ 98,006,180
1% increase (8.50%).....	\$ 6,795,403	\$ 8,454,688	\$ 47,507,631	\$ 79,221,138
Covered Payroll.....	\$ 1,693,751	\$ 3,575,149	\$ 15,869,459	\$ 21,795,849

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability.....	\$ 9,167,760	\$ 22,745,937	\$ 55,492,666	\$ 52,904,581
Ending net pension liability.....	\$ 8,090,096	\$ 20,897,452	\$ 53,697,606	\$ 51,698,881
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 27,282	\$ 70,472	\$ 181,083	\$ 174,342
Changes of assumptions.....	773,316	1,997,547	5,132,850	4,941,796
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	699,438	1,843,235	104,210	1,531,751
Total Deferred Outflows of Resources.....	\$ 1,500,036	\$ 3,911,254	\$ 5,418,143	\$ 6,647,889
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 41,315	\$ 106,719	\$ 274,224	\$ 264,017
Net difference between projected and actual investment earnings on pension plan investments.....	219,742	567,614	1,458,527	1,404,238
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	785,323	1,464,675	2,903,599	928,118
Total Deferred Inflows of Resources.....	\$ 1,046,380	\$ 2,139,008	\$ 4,636,350	\$ 2,596,373
Pension Expense				
Proportionate share of plan pension expense.....	\$ 941,440	\$ 2,431,811	\$ 6,248,726	\$ 6,016,136
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	48,986	259,931	(818,950)	346,120
Total Employer Pension Expense.....	\$ 990,426	\$ 2,691,742	\$ 5,429,776	\$ 6,362,256
Contributions				
Statutory required contribution.....	\$ 764,434	\$ 1,832,388	\$ 4,362,369	\$ 4,619,903
Contribution in relation to statutory required contribution.....	(764,434)	(1,832,388)	(4,364,388)	(4,619,903)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (2,019)	\$ -
Contributions as a percentage of covered payroll.....	25.00%	22.53%	23.75%	19.05%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 266,163	\$ 820,919	\$ 622,552	\$ 1,733,966
June 30, 2020.....	260,383	805,985	584,173	1,697,019
June 30, 2021.....	112,683	484,884	(15,194)	837,421
June 30, 2022.....	(185,573)	(339,542)	(409,738)	(216,890)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 453,656	\$ 1,772,246	\$ 781,793	\$ 4,051,516
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 9,929,236	\$ 25,648,133	\$ 65,904,846	\$ 63,451,747
Current discount rate (7.50%).....	\$ 8,090,096	\$ 20,897,452	\$ 53,697,606	\$ 51,698,881
1% increase (8.50%).....	\$ 6,539,447	\$ 16,891,997	\$ 43,405,282	\$ 41,789,658
Covered Payroll.....	\$ 3,057,294	\$ 8,131,921	\$ 18,372,533	\$ 24,255,608

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability.....	\$ 63,418,247	\$ 82,103,885	\$ 27,434,445	\$ 3,319,310
Ending net pension liability.....	\$ 61,375,790	\$ 83,422,615	\$ 27,084,083	\$ 3,370,594
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 206,976	\$ 281,323	\$ 91,335	\$ 11,367
Changes of assumptions.....	5,866,793	7,974,206	2,588,914	322,188
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	1,346,216	1,048,046	180,574
Total Deferred Outflows of Resources.....	\$ 6,073,769	\$ 9,601,745	\$ 3,728,295	\$ 514,129
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 313,435	\$ 426,024	\$ 138,313	\$ 17,213
Net difference between projected and actual investment earnings on pension plan investments.....	1,667,081	2,265,914	735,654	91,552
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,575,309	362,841	283,822	119,085
Total Deferred Inflows of Resources.....	\$ 4,555,825	\$ 3,054,779	\$ 1,157,789	\$ 227,850
Pension Expense				
Proportionate share of plan pension expense.....	\$ 7,142,224	\$ 9,707,791	\$ 3,151,749	\$ 392,235
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(754,358)	172,684	287,791	21,223
Total Employer Pension Expense.....	\$ 6,387,866	\$ 9,880,475	\$ 3,439,540	\$ 413,458
Contributions				
Statutory required contribution.....	\$ 4,792,481	\$ 6,120,056	\$ 2,318,753	\$ 203,213
Contribution in relation to statutory required contribution.....	(4,792,481)	(7,120,056)	(2,318,753)	(203,213)
Contribution deficiency/(excess).....	\$ -	\$ (1,000,000)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.35%	31.56%	17.99%	17.80%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 893,263	\$ 2,412,148	\$ 1,014,858	\$ 111,706
June 30, 2020.....	849,399	2,352,530	995,499	109,295
June 30, 2021.....	281,133	1,611,978	643,481	75,650
June 30, 2022.....	(505,851)	170,310	(83,332)	(10,372)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,517,944	\$ 6,546,966	\$ 2,570,506	\$ 286,279
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 75,328,538	\$ 102,387,331	\$ 33,241,181	\$ 4,136,839
Current discount rate (7.50%).....	\$ 61,375,790	\$ 83,422,615	\$ 27,084,083	\$ 3,370,594
1% increase (8.50%).....	\$ 49,611,776	\$ 67,432,840	\$ 21,892,818	\$ 2,724,544
Covered Payroll.....	\$ 18,905,798	\$ 22,562,358	\$ 12,887,573	\$ 1,141,452

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability.....	\$ 312,414	\$ 1,343,792	\$ 1,193,547	\$ 1,165,154
Ending net pension liability.....	\$ 313,455	\$ 1,359,538	\$ 2,029,608	\$ 391,160
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,057	\$ 4,585	\$ 6,844	\$ 1,319
Changes of assumptions.....	29,963	129,955	194,006	37,390
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	20,835	98,064	655,085	1,258,693
Total Deferred Outflows of Resources.....	\$ 51,855	\$ 232,604	\$ 855,935	\$ 1,297,402
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 1,601	\$ 6,943	\$ 10,365	\$ 1,998
Net difference between projected and actual investment earnings on pension plan investments.....	8,514	36,928	55,128	10,625
Changes in proportion and differences between employer contributions and proportionate share of contributions.....		21,967	29,783	1,071,016
Total Deferred Inflows of Resources.....	\$ 10,115	\$ 65,838	\$ 95,276	\$ 1,083,639
Pension Expense				
Proportionate share of plan pension expense.....	\$ 36,476	\$ 158,210	\$ 236,188	\$ 45,523
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	7,221	24,054	160,764	89,320
Total Employer Pension Expense.....	\$ 43,697	\$ 182,264	\$ 396,952	\$ 134,843
Contributions				
Statutory required contribution.....	\$ 29,026	\$ 101,238	\$ 112,094	\$ 107,500
Contribution in relation to statutory required contribution.....	(29,026)	(101,238)	(194,843)	(607,500)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (82,749)	\$ (500,000)
Contributions as a percentage of covered payroll.....	18.13%	34.72%	8.19%	45.55%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 15,636	\$ 60,550	\$ 215,248	\$ 99,820
June 30, 2020.....	15,410	59,579	213,799	99,540
June 30, 2021.....	10,304	47,858	178,512	39,136
June 30, 2022.....	390	(1,221)	153,100	(24,733)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 41,740	\$ 166,766	\$ 760,659	\$ 213,763
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 384,714	\$ 1,668,604	\$ 2,491,001	\$ 480,078
Current discount rate (7.50%).....	\$ 313,455	\$ 1,359,538	\$ 2,029,608	\$ 391,160
1% increase (8.50%).....	\$ 253,375	\$ 1,098,951	\$ 1,640,586	\$ 316,182
Covered Payroll.....	\$ 160,096	\$ 291,582	\$ 2,380,023	\$ 1,333,719

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability.....	\$ 1,903,315	\$ 2,550,634	\$ 321,683	\$ 585,986
Ending net pension liability.....	\$ 2,055,364	\$ 3,031,987	\$ 317,151	\$ 509,331
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 6,931	\$ 10,225	\$ 1,069	\$ 1,718
Changes of assumptions.....	196,468	289,822	30,315	48,686
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	107,008	342,831	14,471	46,259
Total Deferred Outflows of Resources.....	\$ 310,407	\$ 642,878	\$ 45,855	\$ 96,663
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 10,496	\$ 15,484	\$ 1,620	\$ 2,601
Net difference between projected and actual investment earnings on pension plan investments.....	55,827	82,354	8,614	13,834
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	111,763	175,391	3,636	58,979
Total Deferred Inflows of Resources.....	\$ 178,086	\$ 273,229	\$ 13,870	\$ 75,414
Pension Expense				
Proportionate share of plan pension expense.....	\$ 239,180	\$ 352,826	\$ 36,913	\$ 59,269
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(12,724)	28,193	4,995	4,026
Total Employer Pension Expense.....	\$ 226,456	\$ 381,019	\$ 41,908	\$ 63,295
Contributions				
Statutory required contribution.....	\$ 122,310	\$ 162,034	\$ 28,517	\$ 43,626
Contribution in relation to statutory required contribution.....	(122,310)	(162,034)	(28,517)	(43,626)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	32.74%	26.41%	14.75%	13.73%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 42,452	\$ 109,586	\$ 13,509	\$ 17,699
June 30, 2020.....	40,985	107,421	13,278	17,335
June 30, 2021.....	33,800	87,826	5,980	382
June 30, 2022.....	15,084	64,816	(782)	(14,167)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 132,321	\$ 369,649	\$ 31,985	\$ 21,249
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 2,522,614	\$ 3,721,260	\$ 389,243	\$ 625,119
Current discount rate (7.50%).....	\$ 2,055,364	\$ 3,031,987	\$ 317,151	\$ 509,331
1% increase (8.50%).....	\$ 1,661,407	\$ 2,450,842	\$ 256,357	\$ 411,707
Covered Payroll.....	\$ 373,534	\$ 613,589	\$ 193,307	\$ 317,832

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Greater Lowell Regional Vocation Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability.....	\$ 14,939,992	\$ 10,353,378	\$ 1,432,356	\$ 8,168,982
Ending net pension liability.....	\$ 15,614,520	\$ 10,714,454	\$ 1,155,540	\$ 8,466,429
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 52,656	\$ 36,132	\$ 3,897	\$ 28,551
Changes of assumptions.....	1,492,562	1,024,173	110,456	809,290
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	509,189	921,862	5,430	204,134
Total Deferred Outflows of Resources.....	\$ 2,054,407	\$ 1,982,167	\$ 119,783	\$ 1,041,975
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 79,740	\$ 54,717	\$ 5,901	\$ 43,236
Net difference between projected and actual investment earnings on pension plan investments.....	424,120	291,024	31,387	229,964
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	821,777	24,048	279,840	401,183
Total Deferred Inflows of Resources.....	\$ 1,325,637	\$ 369,789	\$ 317,128	\$ 674,383
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,817,041	\$ 1,246,835	\$ 134,466	\$ 985,226
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(150,633)	304,693	(78,213)	(85,295)
Total Employer Pension Expense.....	\$ 1,666,408	\$ 1,551,528	\$ 56,253	\$ 899,931
Contributions				
Statutory required contribution.....	\$ 1,179,775	\$ 859,466	\$ 100,489	\$ 605,786
Contribution in relation to statutory required contribution.....	(1,179,775)	(859,466)	(100,489)	(605,786)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	27.55%	19.81%	39.00%	20.54%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 268,536	\$ 592,320	\$ (47,193)	\$ 141,985
June 30, 2020.....	257,375	584,662	(48,019)	135,938
June 30, 2021.....	124,620	390,037	(51,781)	66,314
June 30, 2022.....	78,239	45,359	(50,352)	23,355
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 728,770	\$ 1,612,378	\$ (197,345)	\$ 367,592
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 19,164,220	\$ 13,150,195	\$ 1,418,236	\$ 10,391,129
Current discount rate (7.50%).....	\$ 15,614,520	\$ 10,714,454	\$ 1,155,540	\$ 8,466,429
1% increase (8.50%).....	\$ 12,621,657	\$ 8,660,788	\$ 934,058	\$ 6,843,653
Covered Payroll.....	\$ 4,282,960	\$ 4,338,293	\$ 257,663	\$ 2,949,693

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability.....	\$ 3,254,718	\$ 707,192	\$ 11,779,471	\$ 8,457,396
Ending net pension liability.....	\$ 3,512,891	\$ 814,336	\$ 11,610,214	\$ 7,940,619
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 11,846	\$ 2,746	\$ 39,153	\$ 26,778
Changes of assumptions.....	335,791	77,841	1,109,797	759,029
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	182,377	104,807	53,258	190,937
Total Deferred Outflows of Resources.....	\$ 530,014	\$ 185,394	\$ 1,202,208	\$ 976,744
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 17,940	\$ 4,159	\$ 59,291	\$ 40,551
Net difference between projected and actual investment earnings on pension plan investments.....	95,417	22,119	315,355	215,682
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	187,321	93,700	313,125	501,310
Total Deferred Inflows of Resources.....	\$ 300,678	\$ 119,978	\$ 687,771	\$ 757,543
Pension Expense				
Proportionate share of plan pension expense.....	\$ 408,790	\$ 94,759	\$ 1,351,072	\$ 924,036
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(23,607)	2,545	(65,782)	(78,723)
Total Employer Pension Expense.....	\$ 385,183	\$ 97,304	\$ 1,285,290	\$ 845,313
Contributions				
Statutory required contribution.....	\$ 254,429	\$ 41,187	\$ 914,940	\$ 619,993
Contribution in relation to statutory required contribution.....	(254,429)	(41,187)	(914,940)	(619,993)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.84%	7.37%	18.80%	24.25%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 70,696	\$ 24,406	\$ 245,892	\$ 134,441
June 30, 2020.....	68,186	23,824	237,596	128,765
June 30, 2021.....	55,905	4,227	85,910	66,877
June 30, 2022.....	34,549	12,959	(54,961)	(110,882)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 229,336	\$ 65,416	\$ 514,437	\$ 219,201
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 4,311,490	\$ 999,469	\$ 14,249,592	\$ 9,745,788
Current discount rate (7.50%).....	\$ 3,512,891	\$ 814,336	\$ 11,610,214	\$ 7,940,619
1% increase (8.50%).....	\$ 2,839,571	\$ 658,256	\$ 9,384,857	\$ 6,418,628
Covered Payroll.....	\$ 984,562	\$ 558,955	\$ 4,866,639	\$ 2,556,591

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 7,274,785	\$ 2,003,371	\$ 1,495,958	\$ 609,217
Ending net pension liability.....	\$ 6,492,906	\$ 1,701,694	\$ 1,527,710	\$ 611,202
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 21,896	\$ 5,739	\$ 5,152	\$ 2,061
Changes of assumptions.....	620,645	162,661	146,031	58,423
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	92,573	220,905	87,247	73,141
Total Deferred Outflows of Resources.....	\$ 735,114	\$ 389,305	\$ 238,430	\$ 133,625
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 33,158	\$ 8,690	\$ 7,802	\$ 3,121
Net difference between projected and actual investment earnings on pension plan investments.....	176,360	46,221	41,495	16,601
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	589,040	283,191	7,731	15,601
Total Deferred Inflows of Resources.....	\$ 798,558	\$ 338,102	\$ 57,028	\$ 35,323
Pension Expense				
Proportionate share of plan pension expense.....	\$ 755,566	\$ 198,029	\$ 177,777	\$ 71,127
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(119,539)	(2,243)	24,477	21,202
Total Employer Pension Expense.....	\$ 636,027	\$ 195,786	\$ 202,254	\$ 92,329
Contributions				
Statutory required contribution.....	\$ 540,790	\$ 119,483	\$ 123,408	\$ 42,233
Contribution in relation to statutory required contribution.....	(540,790)	(119,483)	(123,408)	(42,233)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	23.17%	14.12%	28.45%	14.95%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 54,762	\$ 43,438	\$ 65,488	\$ 37,610
June 30, 2020.....	50,121	42,220	64,395	37,173
June 30, 2021.....	(19,782)	26,335	48,426	25,640
June 30, 2022.....	(148,545)	(60,790)	3,093	(2,121)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (63,444)	\$ 51,203	\$ 181,402	\$ 98,302
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 7,968,965	\$ 2,088,537	\$ 1,875,009	\$ 750,146
Current discount rate (7.50%).....	\$ 6,492,906	\$ 1,701,694	\$ 1,527,710	\$ 611,202
1% increase (8.50%).....	\$ 5,248,403	\$ 1,375,522	\$ 1,234,891	\$ 494,050
Covered Payroll.....	\$ 2,333,768	\$ 846,401	\$ 433,785	\$ 282,427

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 514,197	\$ 367,971	\$ 319,057	\$ 990,778
Ending net pension liability.....	\$ 458,176	\$ 436,617	\$ 335,690	\$ 741,792
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,545	\$ 1,472	\$ 1,132	\$ 2,502
Changes of assumptions.....	43,796	41,735	32,088	70,907
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	22,988	96,811	25,159	57,374
Total Deferred Outflows of Resources.....	\$ 68,329	\$ 140,018	\$ 58,379	\$ 130,783
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 2,340	\$ 2,230	\$ 1,714	\$ 3,788
Net difference between projected and actual investment earnings on pension plan investments.....	12,445	11,859	9,118	20,148
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	48,515	7,609	439	183,157
Total Deferred Inflows of Resources.....	\$ 63,300	\$ 21,698	\$ 11,271	\$ 207,093
Pension Expense				
Proportionate share of plan pension expense.....	\$ 53,324	\$ 50,814	\$ 39,060	\$ 86,319
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(3,920)	27,583	7,329	(26,302)
Total Employer Pension Expense.....	\$ 49,404	\$ 78,397	\$ 46,389	\$ 60,017
Contributions				
Statutory required contribution.....	\$ 35,639	\$ 28,513	\$ 28,468	\$ 69,639
Contribution in relation to statutory required contribution.....	(35,639)	(28,513)	(28,468)	(69,639)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	51.95%	20.36%	22.78%	18.92%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 8,379	\$ 39,304	\$ 16,341	\$ (6,389)
June 30, 2020.....	8,053	38,990	16,100	(6,920)
June 30, 2021.....	(263)	29,781	11,981	(18,883)
June 30, 2022.....	(11,140)	10,245	2,686	(44,118)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 5,029	\$ 118,320	\$ 47,108	\$ (76,310)
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 562,327	\$ 535,869	\$ 412,008	\$ 910,428
Current discount rate (7.50%).....	\$ 458,176	\$ 436,617	\$ 335,690	\$ 741,792
1% increase (8.50%).....	\$ 370,351	\$ 352,926	\$ 271,351	\$ 599,613
Covered Payroll.....	\$ 68,604	\$ 140,067	\$ 124,945	\$ 367,987

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 54,061	\$ 1,891,747	\$ 226,087	\$ 454,776
Ending net pension liability.....	\$ 56,771	\$ 792,328	\$ 142,446	\$ 465,317
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 191	\$ 2,672	\$ 480	\$ 1,569
Changes of assumptions.....	5,426	75,737	13,616	44,479
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	34,046	739,776	14,655	34,538
Total Deferred Outflows of Resources.....	\$ 39,663	\$ 818,185	\$ 28,751	\$ 80,586
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 290	\$ 4,046	\$ 727	\$ 2,376
Net difference between projected and actual investment earnings on pension plan investments.....	1,542	21,521	3,869	12,639
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	40,056	854,798	65,267	6,713
Total Deferred Inflows of Resources.....	\$ 41,888	\$ 880,365	\$ 69,863	\$ 21,728
Pension Expense				
Proportionate share of plan pension expense.....	\$ 6,610	\$ 92,200	\$ 16,578	\$ 54,145
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,662	27,289	(11,223)	7,927
Total Employer Pension Expense.....	\$ 8,272	\$ 119,489	\$ 5,355	\$ 62,072
Contributions				
Statutory required contribution.....	\$ 6,473	\$ 68,956	\$ 18,523	\$ 38,079
Contribution in relation to statutory required contribution.....	(6,473)	(68,956)	(18,523)	(38,079)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	5.14%	62.78%	32.39%	45.28%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 3,186	\$ 48,559	\$ (7,399)	\$ 20,418
June 30, 2020.....	3,149	47,997	(7,498)	20,090
June 30, 2021.....	(9,325)	39,417	(12,329)	17,153
June 30, 2022.....	765	(198,153)	(13,886)	1,197
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (2,225)	\$ (62,180)	\$ (41,112)	\$ 58,858
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 69,672	\$ 972,454	\$ 174,826	\$ 571,105
Current discount rate (7.50%).....	\$ 56,771	\$ 792,328	\$ 142,446	\$ 465,317
1% increase (8.50%).....	\$ 45,887	\$ 640,463	\$ 115,141	\$ 376,133
Covered Payroll.....	\$ 125,843	\$ 109,841	\$ 57,183	\$ 84,100

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 478,025	\$ 359,871	\$ 455,142	\$ 159,347
Ending net pension liability.....	\$ 517,839	\$ 335,341	\$ 496,440	\$ 175,037
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,746	\$ 1,131	\$ 1,674	\$ 590
Changes of assumptions.....	49,499	32,054	47,454	16,732
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	39,828	6,427	38,104	38,261
Total Deferred Outflows of Resources.....	\$ 91,073	\$ 39,612	\$ 87,232	\$ 55,583
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 2,644	\$ 1,713	\$ 2,535	\$ 894
Net difference between projected and actual investment earnings on pension plan investments.....	14,065	9,108	13,484	4,754
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	50,370	8,740	2,078
Total Deferred Inflows of Resources.....	\$ 16,709	\$ 61,191	\$ 24,759	\$ 7,726
Pension Expense				
Proportionate share of plan pension expense.....	\$ 60,266	\$ 39,024	\$ 57,765	\$ 20,364
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	11,644	(12,211)	6,565	11,464
Total Employer Pension Expense.....	\$ 71,910	\$ 26,813	\$ 64,330	\$ 31,828
Contributions				
Statutory required contribution.....	\$ 43,578	\$ 19,480	\$ 37,587	\$ 13,494
Contribution in relation to statutory required contribution.....	(43,578)	(19,480)	(37,587)	(13,494)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.43%	9.85%	24.32%	14.56%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ 25,545	\$ (3,209)	\$ 19,892	\$ 16,163
June 30, 2020.....	25,174	(3,448)	19,536	16,042
June 30, 2021.....	17,021	(8,410)	16,968	13,256
June 30, 2022.....	6,624	(6,512)	6,077	2,396
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 74,364	\$ (21,579)	\$ 62,473	\$ 47,857
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 635,552	\$ 411,573	\$ 609,303	\$ 214,835
Current discount rate (7.50%).....	\$ 517,839	\$ 335,341	\$ 496,440	\$ 175,037
1% increase (8.50%).....	\$ 418,578	\$ 271,064	\$ 401,290	\$ 141,492
Covered Payroll.....	\$ 119,617	\$ 197,738	\$ 154,567	\$ 92,703

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability.....	\$ 13,516	\$ 405,503	\$ 147,057	\$ 13,002
Ending net pension liability.....	\$ (15,094)	\$ 380,399	\$ 139,940	\$ 21,871
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ (51)	\$ 1,283	\$ 472	\$ 74
Changes of assumptions.....	(1,443)	36,362	13,377	2,090
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	6,198	8,651	34,061	15,750
Total Deferred Outflows of Resources.....	\$ 4,704	\$ 46,296	\$ 47,910	\$ 17,914
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ (77)	\$ 1,943	\$ 715	\$ 112
Net difference between projected and actual investment earnings on pension plan investments.....	(410)	10,332	3,801	594
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	20,575	20,791	5,414	8,001
Total Deferred Inflows of Resources.....	\$ 20,088	\$ 33,066	\$ 9,930	\$ 8,707
Pension Expense				
Proportionate share of plan pension expense.....	\$ (1,750)	\$ 44,266	\$ 16,280	\$ 2,546
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(3,064)	(1,274)	10,112	3,186
Total Employer Pension Expense.....	\$ (4,814)	\$ 42,992	\$ 26,392	\$ 5,732
Contributions				
Statutory required contribution.....	\$ 3,071	\$ 31,677	\$ 15,481	\$ 967
Contribution in relation to statutory required contribution.....	(3,071)	(31,677)	(15,481)	(967)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	9.78%	15.95%	18.46%	0.85%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ (3,469)	\$ 8,938	\$ 13,869	\$ 3,773
June 30, 2020.....	(3,459)	8,664	13,772	3,757
June 30, 2021.....	(4,193)	608	11,026	279
June 30, 2022.....	(4,263)	(4,980)	(687)	1,398
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (15,384)	\$ 13,230	\$ 37,980	\$ 9,207
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ (18,533)	\$ 466,875	\$ 171,760	\$ 26,841
Current discount rate (7.50%).....	\$ (15,094)	\$ 380,399	\$ 139,940	\$ 21,871
1% increase (8.50%).....	\$ (12,206)	\$ 307,487	\$ 113,122	\$ 17,678
Covered Payroll.....	\$ 31,394	\$ 198,543	\$ 83,875	\$ 113,682

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Ayer-Shirley Regional School District	Totals
Net Pension Liability		
Beginning net pension liability.....	\$ 4,668,086	\$ 1,416,876,555
Ending net pension liability.....	\$ 4,178,529	\$ 1,419,184,751
Deferred Outflows of Resources		
Differences between expected and actual experience.....	\$ 14,091	\$ 4,785,871
Changes of assumptions.....	399,418	135,657,111
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	186,529	40,343,902
Total Deferred Outflows of Resources.....	\$ 600,038	\$ 180,786,884
Deferred Inflows of Resources		
Differences between expected and actual experience.....	\$ 21,339	\$ 7,247,514
Net difference between projected and actual investment earnings on pension plan investments.....	113,497	38,547,705
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	674,957	40,343,902
Total Deferred Inflows of Resources.....	\$ 809,793	\$ 86,139,121
Pension Expense		
Proportionate share of plan pension expense.....	\$ 486,246	\$ 165,494,735
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(125,594)	-
Total Employer Pension Expense.....	\$ 360,652	\$ 165,494,735
Contributions		
Statutory required contribution.....	\$ 419,892	\$ 112,017,087
Contribution in relation to statutory required contribution.....	(419,892)	(115,426,815)
Contribution deficiency/(excess).....	\$ -	\$ (3,409,728)
Contributions as a percentage of covered payroll.....	11.76%	24.79%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense		
June 30, 2019.....	\$ (13,422)	\$ 38,097,737
June 30, 2020.....	(16,407)	37,083,503
June 30, 2021.....	(101,156)	21,398,919
June 30, 2022.....	(78,770)	(1,932,396)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (209,755)	\$ 94,647,763
Discount Rate Sensitivity		
1% decrease (6.50%).....	\$ 5,128,453	\$ 1,741,812,266
Current discount rate (7.50%).....	\$ 4,178,529	\$ 1,419,184,751
1% increase (8.50%).....	\$ 3,377,626	\$ 1,147,166,823
Covered Payroll.....	\$ 3,569,897	\$ 451,777,105
See notes to schedule of employer allocations and schedule of pension amounts by employer.		(Concluded)

NOTE I – Schedule of Employer Allocations

Governmental Accounting Standards Board (GASB) Statement #68 requires employers participating in a cost-sharing pension plan to recognize pension liabilities as employees provide services to the government and earn their pension benefits. Employers participating in cost-sharing plans are required to recognize their proportionate share of the plan's collective pension amounts for all benefits provided through the plan including the net pension liability, deferred outflows of resources, deferred inflows of resources, pension expense, and contributions.

GASB Statement #68 requires the allocation of the collective pension amounts be consistent with the manner in which contributions to the plan are determined. As permissible under GASB Statement #68, The Schedule of Employer Allocations is used to demonstrate the allocation of Middlesex County Retirement System's collective pension amounts.

Massachusetts General Law (MGL) Chapter 32 Section 22 Paragraph 7c dictates that Massachusetts cost sharing defined benefit pension plans allocate the annual required pension fund appropriation to employer units based on their proportionate share of the aggregate of the annual rates of regular compensation of all members in service of the system. The Public Employee Retirement Administration Commission (PERAC) approves each system's proportionate share of the annual required contribution. PERAC can accept alternative allocation methodologies and as such the System has elected to use an actuarial based allocation methodology. Accordingly, the each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the System's net position at year end is calculated by starting with the balance carried forward from the prior year. Each member unit is then credited with the actual required contribution received during the year along with any excess contributions received. Each member unit's share is reduced by the actual payment made to their specific retirees. Net investment income is allocated based on each member's money-weighted rate of return. All other shared expenses are allocated based the proportionate share of the total pension liability. The difference between the total pension liability and the net position is reported as the net pension liability.

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County and Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2017, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the System's funding schedule. No assets have been allocated to cover the remaining liability and therefore the liability has been allocated to the remaining member units.

The current employees, retirees, beneficiaries and inactive participants of the Middlesex County Retirement System have been identified and their total pension liability has been actuarially determined. For transparency purposes, the System has historically paid a contribution as an employer to itself. However with the implementation of GASB 67 & 68 the net pension liability is allocated to each member unit.

When a member unit accepts an Early Retirement Incentive Program (E.R.I. or ERIP), PERAC completes an analysis of the costs and liabilities attributable to the additional benefits payable in accordance with the ERIP. The accrued liability for the members who accept the ERIP as retirees including the ERIP less the accrued liability for the members as active employees excluding the ERIP represents the increase in accrued liability due to the ERIP. The net increase is amortized for each member unit accepting the ERIP, and is separately identified in the system's funding schedule. The 2002 ERIP amortization is straight line ending in fiscal 2019. The 2003 ERIP

amortization is straight line ending in fiscal 2020. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE II – Schedule of Pension Amounts by Employer

The Schedule of Pension Amounts by Employer presents the net pension liability, the various categories of deferred outflows of resources and deferred inflows of resources, contributions and pension expense for all participating employers including differences between expected and actual economic experience; differences between projected and actual investment earnings, net; and changes of assumptions.

Changes in Assumptions

The following assumption changes were reflected in the January 1, 2018 actuarial valuation:

- The mortality tables for healthy participants were changed from the RP-2000 Employee and Healthy Annuitant Mortality Tables projected generationally using Scale BB2D from 2009 to the RP-2014 Blue Collar Employee and Healthy Annuitant Mortality Tables projected generationally using Scale MP-2017.
- The mortality tables for disabled participants were changed from the RP-2000 Healthy Annuitant Mortality Table projected generationally using Scale BB2D from 2015 to the RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward 1 year projected generationally using Scale MP-2017.
- The long-term salary increase assumption was lowered by 0.25%, to 4.00% for Group 1 participants, 4.25% for Group 2 participants, and 4.50% for Group 4 participants.
- The investment rate of return assumption was reduced from 7.75% to 7.50%.
- The inflation rate was reduced to 3.25% from the previous rate of 3.50%.

Changes in Plan Provisions

None.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2016

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2016

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Financial Section



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

Report on the Financial Statements

We have audited the accompanying financial statements of Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2016, and the related notes to the financial statements, which collectively comprise the Middlesex County Retirement System's financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Middlesex County Retirement System as of December 31, 2016, and the results of its operations and changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis; the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Return be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated June 30, 2017, on our consideration of the Middlesex County Retirement System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Middlesex County Retirement System's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System, the Public Employee Retirement Administration Commission and all member units and is not intended to be and should not be used by anyone other than these specified parties.



June 30, 2017

Management's Discussion and Analysis

As management of the Middlesex County Retirement System, we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2016. The System complies with financial reporting requirements issued by the Governmental Accounting Standards Board (GASB).

The GASB is the authoritative standard setting body that provides guidance on how to prepare financial statements in conformity with generally accepted accounting principles (GAAP). Users of these financial statements rely on the GASB to establish consistent reporting standards for all governments in the United States. This consistent application is the only way users can assess the financial condition of a public retirement system compared to others.

Financial Highlights

- The System's assets exceeded its liabilities at the close of the most recent year by \$1.2 billion (net position).
- The System's net position increased by \$77.9 million for the year ended December 31, 2016.
- Total investment income was \$80.7 million; investment expenses were \$5.8 million; and net investment income was \$74.9 million.
- Total contributions were \$161.4 million, primarily consisting of \$107.1 million from employers, \$47.1 from members and \$7.2 million from other retirement systems for their share of retiree pension payments.
- Retirement benefits and refunds were \$150.6 million and transfers of member deductions amounted to \$4.3 million.
- Depreciation, administrative and building expenses were \$3.5 million.
- The Total Pension Liability is \$2.6 billion as of December 31, 2016, while the Net Pension Liability is \$1.4 billion.
- The Plan fiduciary net position as a percentage of the total pension liability is 45.49%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the System fiduciary financial statements. These fiduciary financial statements comprise of four components: 1) management's discussion and analysis, 2) fiduciary financial statements, 3) notes to the financial statements and 4) required supplementary information.

Fiduciary Financial Statements

The *statement of net position* presents information on all assets and deferred outflows less deferred inflows and liabilities with the difference reported as *net position*. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position is improving or deteriorating.

The *statement of changes in fiduciary net position* presents information showing how the system's net position changed during the most recent year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, *regardless of the timing of related cash flows*. Thus, additions and deductions are reported in this statement for some items that will only result in cash flows in future periods.

Notes to the financial statements

The notes provide additional information that is essential to a full understanding of the data provided in the fiduciary financial statements.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Return be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context.

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the System's financial position. The System's net position exceeded liabilities by \$1.2 billion at the close of 2016.

The assets accumulated are held to provide pension benefits for qualified retirees along with active and inactive employees of the member units. At year end the system's net position include investments of \$1.1 billion, cash of \$69.3 million and current accounts receivable of \$7.4 million. The system also had capital assets, net of accumulated depreciation of \$5.6 million at year-end primarily consisting of land, an office building, and building improvements.

In 2016 the System's contributions were \$161.4 million while deductions were \$158.4 million which resulted in a current surplus of \$3.0 million. In 2015 the System's contributions were \$148.7 million while deductions were \$145.6 million which resulted in a prior year surplus of \$3.1 million. Therefore for these two years the System was able to sustain operations independent of investment income.

The primary change in net position over the prior year relates to each year's investment performance. Net investment income was \$74.9 million and \$7.8 million in 2016 and 2015 respectively. The annual money weighted rate of return was 7.35% and 0.61% in 2016 and 2015 respectively. The system's investment policy is designed to achieve a long-term rate of return of 7.75% and fluctuation in annual investment returns is expected.

The following tables present summarized financial information for the past two years.

Condensed Statement of Fiduciary Net Position

	2016	2015
Assets:		
Cash.....	\$ 69,317,187	\$ 48,386,377
Investments.....	1,100,286,524	1,045,843,118
Receivables.....	7,408,840	4,685,100
Prepaid assets.....	-	61,415
Capital assets, net of accumulated depreciation.....	5,625,313	5,646,331
Total assets.....	1,182,637,864	1,104,622,341
Liabilities:		
Accounts payable.....	129,806	121,604
Other.....	87,864	17,840
Total liabilities.....	217,670	139,444
Net Position Restricted for Pensions.....	\$ 1,182,420,194	1,104,482,897

Condensed Statement of Changes in Fiduciary Net Position

	<u>2016</u>	<u>2015</u>
Additions:		
Contributions:		
Member contributions.....	\$ 47,097,081	\$ 45,941,291
Employer contributions.....	107,096,707	99,820,481
Other contributions.....	<u>7,191,133</u>	<u>2,954,865</u>
Total contributions.....	<u>161,384,921</u>	<u>148,716,637</u>
Net investment income (loss):		
Total investment income (loss).....	80,720,725	13,362,645
Less, investment expenses.....	<u>(5,803,179)</u>	<u>(5,545,390)</u>
Net investment income (loss).....	<u>74,917,546</u>	<u>7,817,255</u>
Total additions.....	<u>236,302,467</u>	<u>156,533,892</u>
Deductions:		
Administration.....	3,062,521	2,824,804
Retirement benefits, refunds and transfers.....	154,904,388	142,321,498
Building operations and maintenance.....	235,667	302,773
Depreciation.....	<u>162,594</u>	<u>162,594</u>
Total deductions.....	<u>158,365,170</u>	<u>145,611,669</u>
Net increase (decrease) in fiduciary net position.....	77,937,297	10,922,223
Fiduciary net position at beginning of year.....	<u>1,104,482,897</u>	<u>1,093,560,674</u>
Fiduciary net position at end of year.....	<u>\$ 1,182,420,194</u>	<u>\$ 1,104,482,897</u>

Requests for Information

This financial report is designed to provide a general overview of the System's finances for all those with an interest in the System's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the System's Chief Administrative Officer, 25 Linnell Circle, Billerica, Massachusetts 01865.

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2016

Assets

Cash.....	\$	<u>69,317,187</u>
Investments:		
PRIT funds.....		1,088,943,336
Pooled alternative investments.....		6,055,547
Pooled real estate funds.....		<u>5,287,641</u>
Total investments.....		<u>1,100,286,524</u>
Receivables:		
Member deductions.....		2,539,358
Members contributions.....		3,816
Member make-up payments and redeposits.....		142,330
Reimbursements from other systems.....		3,896,021
Pension fund appropriations.....		71,673
Other.....		<u>755,642</u>
Total receivables.....		<u>7,408,840</u>
Capital assets, net of accumulated depreciation.....		<u>5,625,313</u>
Total assets.....		<u>1,182,637,864</u>

Liabilities

Accounts payable.....		129,806
Other.....		<u>87,864</u>
Total liabilities.....		<u>217,670</u>

Net Position Restricted for Pensions \$ 1,182,420,194

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED DECEMBER 31, 2016

Additions:	
Contributions:	
Member contributions.....	\$ 42,015,296
Member contributions - transfers from other systems.....	4,255,620
Retirement benefits - 3(8)c contributions from other systems.....	7,191,133
Members' makeup payments and redeposits.....	826,165
Workers compensation settlements.....	29,000
Employer - federal grant contributions.....	35,496
Employer contributions.....	<u>107,032,211</u>
Total contributions.....	<u>161,384,921</u>
Net investment income (loss):	
Investment income.....	80,720,725
Less, investment expenses.....	<u>(5,803,179)</u>
Net investment income (loss).....	<u>74,917,546</u>
Total additions.....	<u>236,302,467</u>
Deductions:	
Administration.....	3,062,521
Member contributions - transfers to other systems.....	4,268,570
Retirement benefits - 3(8)c payments to other systems.....	11,554,903
Retirement benefits and refunds.....	139,080,915
Building operations and maintenance.....	235,667
Depreciation.....	<u>162,594</u>
Total deductions.....	<u>158,365,170</u>
Net increase (decrease) in fiduciary net position.....	77,937,297
Fiduciary net position at beginning of year.....	<u>1,104,482,897</u>
Fiduciary net position at end of year.....	<u>\$ 1,182,420,194</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week. As of January 1, 2016, the System had 71 participating employers.

Instituted in 1937, the System is a member of the Massachusetts Contributory Retirement System and is governed by Chapter 32 of the Massachusetts General Laws. Membership in the Plan is mandatory immediately upon the commencement of employment for all permanent, full-time employees.

Massachusetts contributory retirement system benefits are, with certain exceptions, uniform from system to system. The System provides for retirement allowance benefits up to a maximum of 80% of a member's highest three-year average annual rate of regular compensation for those hired prior to April 2, 2012 and the highest five-year average for members hired after that date. Benefit payments are based upon a member's age, length of creditable service, level of compensation, and group classification.

Members become vested after ten years of creditable service. A superannuation retirement allowance may be received upon the completion of 20 years of service or upon reaching the age of 55 with 10 years of service. Normal retirement for most employees occurs at age 65 (except for certain hazardous duty and public safety positions, whose normal retirement is at age 55).

A retirement allowance consists of two parts: an annuity and a pension. A member's accumulated total deductions and the interest they generate constitute the annuity. The differential between the total retirement benefit and the annuity is the pension.

Active members contribute between 5% and 11% of their gross regular compensation. The percentage rate is keyed to the date upon which an employee's membership commences. These deductions are deposited in the Annuity Savings Fund and earn interest at a rate determined by the Public Employee Retirement Administration Commission's (PERAC) actuary. When a member's retirement becomes effective, his/her deductions and related interest are transferred to the Annuity Reserve Fund. Any cost-of-living adjustments granted between 1981 and 1997 and any increase in other benefits imposed by the Commonwealth of Massachusetts' state law during those years are borne by the Commonwealth and are deposited into the Pension Fund. Cost-of-living adjustments granted after 1997 must be approved by the System and all costs are borne by the System.

The pension portion of any retirement benefit is paid from the Pension Fund. The governmental unit employing the member must annually appropriate and contribute the amount of current-year pension assessment.

Administrative expenses, which were previously appropriated from the governmental entities whose employees are members of the system, are now paid from investment income.

Members who become permanently and totally disabled for further duty may be eligible to receive a disability retirement allowance. The amount of benefits to be received in such cases is dependent on several factors, including whether or not the disability is work related, the member's age, years of creditable service, level of compensation, veterans' status and group classification.

Survivor benefits are extended to eligible beneficiaries of members whose death occurs prior to or following retirement.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements of the Middlesex County Retirement System have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is the recognized standard-setting body for establishing governmental accounting and financial reporting principles.

MCRS is a special-purpose government engaged only in fiduciary activities. Accordingly, the financial statements are reported using the flow of economic resources measurement focus and use the accrual basis of accounting. Under this method, additions are recorded when earned and deductions are recorded when the liabilities are incurred.

Cash and Investments

Cash and cash equivalents are considered to be cash on hand, demand deposits and short-term investments with an original maturity of three months or less from the date of acquisition. Investments are carried at fair value. The fair values were determined by the closing price for those securities traded on national stock exchanges and at the average bid-and-asked quotation for those securities traded in the over-the-counter market. The fair value of private equities are based on management's valuation of estimates and assumptions from information and representations provided by the respective general partners, in the absence of readily ascertainable market values. Real estate assets are reported at fair value utilizing an income approach to valuation along with independent appraisals and estimates by management.

Fair Value Measurements

The System reports required types of financial instruments in accordance with the fair value standards. These standards require an entity to maximize the use of observable inputs (such as quoted prices in active markets) and minimize the use of unobservable inputs (such as appraisals or valuation techniques) to determine fair value. Fair value standards also require the government to classify these financial instruments into a three-level hierarchy, based on the priority of inputs to the valuation technique or in accordance with net asset value practical expedient rules, which allow for either Level 2 or Level 3 depending on lock up and notice periods associated with the underlying funds.

Instruments measured and reported at fair value are classified and disclosed in one of the following categories:

Level 1 – Quoted prices are available in active markets for identical instruments as of the reporting date. Instruments, which are generally included in this category, include actively traded equity and debt securities, U.S. government obligations, and mutual funds with quoted market prices in active markets.

Level 2 – Pricing inputs are other than quoted in active markets, which are either directly or indirectly observable as of the reporting date, and fair value is determined through the use of models or other valuation methodologies. Certain fixed income securities, primarily corporate bonds, are classified as Level 2 because fair values are estimated using pricing models, matrix pricing, or discounted cash flows.

Level 3 – Pricing inputs are unobservable for the instrument and include situations where there is little, if any, market activity for the instrument. The inputs into the determination of fair value require significant management judgment or estimation.

In some instances the inputs used to measure fair value may fall into different levels of the fair value hierarchy and is based on the lowest level of input that is significant to the fair value measurement.

Market price is affected by a number of factors, including the type of instrument and the characteristics specific to the instrument. Instruments with readily available active quoted prices generally will have a higher degree of market price observability and a lesser degree of judgment used in measuring fair value. It is reasonably possible that change in values of these instruments will occur in the near term and that such changes could materially affect amounts reported in these financial statements. For more information on the fair value of the System's financial instruments, see Note 5 – Cash and Investments.

Accounts Receivable

Accounts receivable consist of member deductions, pension fund appropriations, and other miscellaneous reimbursements. These receivables are considered 100% collectible and therefore do not report an allowance for uncollectibles.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of fiduciary net position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents a consumption of fiduciary net position that applies to a future period(s) and so will not be recognized as an outflow of resources (deduction) until then. The MCRS did not have any items that qualify for reporting in this category.

In addition to liabilities, the statement of fiduciary net position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources*, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (addition) until that time. The MCRS did not have any items that qualify for reporting in this category.

NOTE 3 – PLAN ADMINISTRATION

The System is administered by a five-person Board of Retirement consisting of a first member, who shall serve as Chairman/Treasurer, who shall be appointed by the other four members, a second member elected by the Advisory Council consisting of representatives from the member units, a third and fourth member who shall be elected by the members in or retired from the service of such system, and a fifth member who shall be chosen by the other four members.

Chairman	Thomas F. Gibson	Term Expires:	12/31/2020
Advisory Council Member	Brian P. Curtin	Term Expires:	12/31/2018
Elected Member	John Brown	Term Expires:	12/31/2017
Elected Member	Joseph W. Kearns	Term Expires:	12/31/2019
Appointed Member	Robert W. Healy	Term Expires:	12/17/2020

Board members are required to meet at least once a month. The Board must keep a record of all of its proceedings. The Board must annually submit to the appropriate authority an estimate of the expenses of administration and cost of operation of the System. The Board must annually file a financial statement of condition for the System with the Executive Director of PERAC.

The investment of the System's funds is the responsibility of the Board. All retirement allowances must be

approved by the Retirement Board. The PERAC Actuary performs verification prior to payment, unless the System has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the System must be approved by a majority vote of the Board. Payments shall be made only upon vouchers signed by three persons designated by the Board.

The following retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts as follows:

Treasurer-Custodian:	)	\$10,000,000	Fiduciary
Ex-Officio Member:	)	RLI Insurance Company	
Elected Members:)		
Appointed Members:	)	\$1,000,000	Fidelity
Staff Employees:	)	National Union Fire Insurance	

NOTE 4 – OFFICE BUILDING

The MCRS owns an office building that was purchased as an investment and for the administrative offices of the System. The building is a two story, 1986-built office building consisting of 62,307 square feet of net rentable area. The property is situated on a 4.23 acre site in Billerica, Middlesex County, Massachusetts

NOTE 5 – CASH AND INVESTMENTS

Custodial Credit Risk - Deposits

At December 31, 2016, the carrying amount of the System's deposits totaled \$49,956,765, and the bank balance totaled \$51,545,308, all of which was covered by Federal Depository Insurance.

Investments

The System's investments are as follows:

<u>Other Investments</u>	
PRIT Pooled Funds.....	\$ 1,088,943,336
Money Market Mutual Funds.....	19,360,422
Pooled Alternative Investments.....	6,055,547
Pooled Real Estate Funds.....	<u>5,287,641</u>
Total Investments.....	<u>\$ 1,119,646,946</u>

Approximately 97% of the Retirement System's investments are in Pension Reserve Investment Trust (PRIT). This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board. The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The Administration does not have the ability to control any of the investment decisions relative to its funds in PRIT.

Approximately 1% of the System's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 2% of the System's funds are invested in money market mutual funds. The market values of assets in those funds are valued using prices quoted in active markets for those securities.

The Administration's annual money-weighted rate of return on pension plan investments was 7.35%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Market Value of Investments

The retiree pension defined benefit plan holds significant amounts of investments that are measured at fair value on a recurring basis. Because investing is a key part of the plan's activities, the plan shows greater disaggregation in its disclosures. The plan chooses a tabular format for disclosing the levels within the fair value hierarchy.

The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles.

The System has the following recurring fair value measurements as of December 31, 2016:

Investment Type	12/31/2016	Fair Value Measurements Using		
		Quoted Prices in Active Markets for Identical Assets (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)
Investments by fair value level.....				
<u>Other Investments</u>				
Money Market Mutual Funds.....	\$ 19,360,422	\$ 19,360,422	\$ -	\$ -
Pooled Alternative Investments.....	6,055,547	-	-	6,055,547
Pooled Real Estate Funds.....	5,287,641	-	-	5,287,641
Total Investments by fair value level.....	30,703,610	\$ 19,360,422	\$ -	\$ 11,343,188
Investments measured at the net asset value (NAV).....				
PRIT Investments.....	1,088,943,336			
Total Investments.....	\$ 1,119,646,946			

Money Market Mutual Funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled Alternative Investments and Pooled Real Estate Funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method. This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board (PRIM). The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The System does not have the ability to control any of the investment decisions relative to its funds in PRIT.

NOTE 6 – CAPITAL ASSETS

Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

<u>Capital Asset Type</u>	<u>Estimated Useful Life (in years)</u>
Building.....	40
Building improvements.....	40
Ford Pick-up truck with plow.....	5

Capital asset activity for the year ended December 31, 2016, was as follows:

	<u>Beginning Balance</u>	<u>Increases</u>	<u>Decreases</u>	<u>Ending Balance</u>
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
Construction in progress.....	<u>587,994</u>	<u>141,576</u>	<u>-</u>	<u>729,570</u>
Total capital assets not being depreciated.....	<u>1,260,651</u>	<u>141,576</u>	<u>-</u>	<u>1,402,227</u>
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,086,623	-	-	1,086,623
Ford Pick-up truck with plow.....	<u>19,603</u>	<u>-</u>	<u>-</u>	<u>19,603</u>
Total capital assets being depreciated.....	<u>6,523,362</u>	<u>-</u>	<u>-</u>	<u>6,523,362</u>
<u>Less accumulated depreciation for:</u>				
Buildings.....	(1,764,926)	(135,428)	-	(1,900,354)
Building improvements.....	(353,153)	(27,166)	-	(380,319)
Ford Pick-up truck with plow.....	<u>(19,603)</u>	<u>-</u>	<u>-</u>	<u>(19,603)</u>
Total accumulated depreciation.....	<u>(2,137,682)</u>	<u>(162,594)</u>	<u>-</u>	<u>(2,300,276)</u>
Total capital assets being depreciated, net.....	<u>4,385,680</u>	<u>(162,594)</u>	<u>-</u>	<u>4,223,086</u>
Total capital assets, net.....	<u>\$ 5,646,331</u>	<u>\$ (21,018)</u>	<u>\$ -</u>	<u>\$ 5,625,313</u>

NOTE 7 – MEMBERSHIP

The following table represents the System's membership at December 31, 2016:

Active members.....	9,997
Inactive members.....	2,317
Disabled members.....	437
Retirees and beneficiaries currently receiving benefits.....	<u>4,957</u>
Total.....	<u>17,708</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2016, were as follows:

Total pension liability.....	\$ 2,599,296,751
The pension plan's fiduciary net position.....	<u>1,182,420,194</u>
The net pension liability.....	<u>\$ 1,416,876,557</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	45.49%

The total pension liability was determined by an actuarial valuation as of January 1, 2016, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2016:

Valuation date.....	January 1, 2016
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.5% for fiscal 2018 through fiscal 2024, 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, 2016, 3 years remaining for 2002 ERI liability, 4 years remaining for 2003 ERI liability, 6 years remaining for 2010 ERI liability, and 19 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.
Inflation rate.....	3.50%
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.....	3.0% of the first \$14,000 of retirement income.
Rates of retirement.....	Varies based upon age for general employees, police and fire employees.
Rates of disability.....	For general employees, it was assumed that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).
Mortality Rates:	
Pre-Retirement.....	The RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D.
Post-Retirement.....	The RP-2000 Employee Mortality Table projected generationally from 2009 with Scale BB2D.
Disabled Retiree.....	The RP-2000 Healthy Annuitant Mortality Table projected generationally from 2015 with Scale BB2D.
Investment rate of return/Discount rate.....	7.75%, net of pension plan investment expense, including inflation previously 7.875%

Investment policy: The pension plan's policy in regard to the allocation of invested assets is established by PRIT. Plan assets are managed on a total return basis with a long-term objective of achieving a fully funded status for the benefits provided through the pension plan.

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 January 1, 2016, are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return	Long-Term Expected Asset Allocation
Domestic equity.....	7.50%	19.50%
International equity.....	7.83%	16.80%
Emerging markets equity.....	9.61%	6.90%
Core fixed income.....	3.75%	12.30%
Value-added fixed income.....	7.26%	8.30%
Private Equity.....	9.50%	11.10%
Real estate.....	6.50%	10.00%
Timber/natural resources.....	6.00%	3.60%
Hedge funds.....	6.48%	9.00%
Liquidating portfolios.....	6.48%	0.40%
Portfolio completion strategies.....	6.48%	1.10%
Overlay.....	6.48%	1.00%
		100.00%

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 rate. 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 position liability to changes in the discount rate. The following presents the net position liability, calculated using the discount rate of 7.75%, as well as what the net position 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:

	1% Decrease (6.75%)	Current Discount (7.75%)	1% Increase (8.75%)
Middlesex County Retirement System's net pension liability as of December 31, 2016.....	\$ 1,711,007,052	\$ 1,416,876,557	\$ 1,168,296,041

Contributions: Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The pension fund appropriations are allocated amongst employers based on the actuarial valuation.

NOTE 9 – TOWN OF ACTON SETTLEMENT

In March of 2011 the Town of Acton and the MCRS reached a settlement regarding a civil suit filed by the Town of Acton. The Town of Acton sought relief relating to increased assessments due to investment losses incurred by the System. The MCRS agreed to credit against (i.e. to reduce) Acton's annual assessment by a total credit of \$300,000, which is to be credited, at a minimum, in installments of \$37,500 per year for a period of eight years or in larger installments until the total credit of \$300,000 is paid in full to Acton, whichever is earlier. Without limiting the foregoing, the MCRS intends to fund the credit through the System's operating budget and will not increase assessments to members of the System (including Acton) to fund the credit. The Parties agree that Acton shall receive the credit for each year that Acton is a member of the MCRS so that if Acton ceases to be a member of the MCRS, any remaining amount of the credit then outstanding will be forfeited. The Parties further agree that the MCRS may, at its discretion, credit all or a part of this obligation in one year. If the MCRS credits more than \$37,500 in any given year, the remaining years' obligations will be ratably and proportionally reduced. As of December 31, 2016, the Town of Acton has been credited the full amount of \$300,000.

NOTE 10 – DISPUTE WITH THE COMMONWEALTH AND STATE EMPLOYEES RETIREMENT SYSTEM

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County be transferred to the Commonwealth. Therefore the MCRS was required to transfer the Annuity Savings Fund Balances of these transferred County employees to the State Employees Retirement System (SERS). This transfer, totaling approximately \$18 million, was made during calendar year 1998.

In December of 1999, the State Legislature enacted Massachusetts General Law, Chapter 34B (Abolition of County Government). This legislation, among other things, defines the components of determining the overall surplus or deficit of an abolished County upon transfer to the Commonwealth and how regional retirement systems will be affected. Sections 8 and 18 addressed how the abolished County's unfunded liabilities in regional retirement systems will be paid for. The MCRS believes, as a result of the abolishment of Middlesex County, that the Commonwealth of Massachusetts owed them \$9,501,680 for the Unfunded Liability for retirees of the former Middlesex County.

The Commonwealth and SERS did not agree with the assertion that the MCRS was owed \$9,501,680. As a result, the MCRS acted to stop 3(8)(c) reimbursements to the State Employees Retirement System and correspondingly the State System began to intercept all COLA reimbursements which were due the MCRS. In 2012 the MCRS reinstated payments for 3(8)(c) reimbursements to the SERS. The SERS and MCRS are currently working to determine the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld. It is expected that all amounts except for the \$9.5 million will be resolved in 2017. The net amount of these transactions is not considered significant and has not been reported in these financial statements.

NOTE 11 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

During 2016, the following GASB pronouncements were implemented:

- GASB Statement #72, *Fair Value Measurement and Application*. Notes to the basic financial statements were changed to provide additional disclosure on fair value measurement.
- GASB Statement #73, *Accounting and Financial Reporting for Pensions and Related Assets That Are Not within the Scope of GASB Statement 68, and Amendments to Certain Provisions of GASB Statements 67 and 68*. This pronouncement did not impact the basic financial statements.
- GASB Statement #76, *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments*. This pronouncement did not impact the basic financial statements.
- GASB Statement #79, *Certain External Investment Pools and Pool Participants*. The basic financial statements and related notes were updated to be in compliance with this pronouncement.

The following GASB pronouncements will be implemented in the future:

- The GASB issued Statement #78, *Pensions Provided through Certain Multiple-Employer Defined Benefit Pension Plans*, which is required to be implemented in 2017.
- The GASB issued Statement #82, *Pension Issues – an amendment of GASB Statements #67, #68, and #73*, which is required to be implemented in 2018.

Management is currently assessing the impact the implementation of these pronouncements will have on the basic financial statements.

NOTE 12 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through June 30, 2017, which is the date the financial statements were available to be issued.

Required Supplementary Information

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
AND RELATED RATIOS**

	2014	2015	2016
Total pension liability:			
Service cost.....	\$ 52,132,389	\$ 54,217,685	\$ 56,386,392
Interest.....	172,094,226	179,703,272	187,359,946
Differences between expected and actual experience.....	-	-	7,976,453
Changes in assumptions.....	-	-	96,500,754
Benefit payments, including refunds of employee contributions.....	<u>(125,082,678)</u>	<u>(134,295,504)</u>	<u>(143,428,636)</u>
Net change in total pension liability.....	99,143,937	99,625,453	204,794,909
Total pension liability, beginning.....	<u>2,195,732,452</u>	<u>2,294,876,389</u>	<u>2,394,501,842</u>
Total pension liability, ending (a).....	<u>\$ 2,294,876,389</u>	<u>\$ 2,394,501,842</u>	<u>\$ 2,599,296,751</u>
Plan fiduciary net position:			
Member contributions.....	\$ 39,806,980	\$ 40,870,163	\$ 42,841,461
Employer contributions.....	93,400,946	99,820,481	107,067,707
Net investment income (loss).....	74,962,895	7,817,255	74,917,546
Retirement benefits and refunds.....	(125,082,678)	(134,295,504)	(143,428,635)
Administrative expenses.....	<u>(3,540,884)</u>	<u>(3,290,172)</u>	<u>(3,460,782)</u>
Net increase (decrease) in fiduciary net position.....	79,547,259	10,922,223	77,937,297
Fiduciary net position at beginning of year.....	<u>1,014,013,415</u>	<u>1,093,560,674</u>	<u>1,104,482,897</u>
Fiduciary net position at end of year (b).....	<u>\$ 1,093,560,674</u>	<u>\$ 1,104,482,897</u>	<u>\$ 1,182,420,194</u>
Net pension liability - ending (a) - (b).....	<u>\$ 1,201,315,715</u>	<u>\$ 1,290,018,945</u>	<u>\$ 1,416,876,557</u>
Plan fiduciary net position as a percentage of the total pension liability.....	47.65%	46.13%	45.49%
Covered-employee payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322
Net pension liability as a percentage of covered-employee payroll.....	288.95%	298.35%	322.28%

Note: this schedule is intended to present information for 10 years. Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

SCHEDULE OF CONTRIBUTIONS

	<u>2014</u>	<u>2015</u>	<u>2016</u>
Actuarially determined contribution.....	\$ 92,826,743	\$ 98,792,642	\$ 105,246,797
Contributions in relation to the actuarially determined contribution.....	<u>93,400,946</u>	<u>99,820,481</u>	<u>107,067,707</u>
Contribution deficiency (excess).....	\$ <u>(574,203)</u>	\$ <u>(1,027,839)</u>	\$ <u>(1,820,910)</u>
Covered-employee payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322
Contributions as a percentage of covered- employee payroll.....	22.47%	23.09%	24.35%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those
years for which information is available.

See notes to required supplementary information.

SCHEDULE OF INVESTMENT RETURN

<u>Year</u>	<u>Annual money-weighted rate of return, net of investment expense</u>
2014.....	7.54%
2015.....	0.61%
2016.....	7.35%

Note: this schedule is intended to present information for 10 years. Until a 10-year trend is compiled, information is presented for those years for which information is available.

The annual money-weighted rate of return has been calculated by the Pension Reserves Investment Management Board (PRIM).

See notes to required supplementary information.

NOTE A – CHANGES IN THE NET PENSION LIABILITY AND RELATED RATIOS

The Schedule of Changes in the Net Pension Liability and Related Ratios includes the detailed changes in the system's total pension liability, changes in the system's net position, and the ending net pension liability. It also demonstrates the plan's net position as a percentage of the total pension liability and the net pension liability as a percentage of covered payroll.

NOTE B – CONTRIBUTIONS

Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The total appropriations are payable on July 1 and January 1. Employers may choose to pay the entire appropriation in July at a discounted rate. Accordingly, actual employer contributions may be less than the "total appropriation". The pension fund appropriations are allocated amongst employers based on the actuarial valuation results. In addition, an employer may contribute more than the amount required.

NOTE C – MONEY WEIGHTED RATE OF RETURN

The money weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. A money weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested. Inputs to the money weighted rate of return calculation are determined monthly.

Audit of Specific Elements, Accounts and Items of Financial Statements



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

We have audited the accompanying schedule of employer allocations of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2016, and the related notes. We have also audited the total for all entities of the rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total covered payroll, total pension expense and contributions included in the accompanying schedule of pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2016, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and total for all rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total covered payroll, total pension expense and contributions for the total of all participating entities for the Middlesex County Retirement System as of and for the year ended December 31, 2016, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the Middlesex County Retirement System as of and for the year ended December 31, 2016, and our report thereon, dated June 30, 2017, expressed an unmodified opinion on those financial statements.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System management, the Middlesex County Retirement System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.



June 30, 2017

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2016

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	45,680,759	3.224047%
Town of Ashby.....	1,387,848	0.097951%
Town of Ashland.....	31,797,911	2.244226%
Town of Ayer.....	17,032,643	1.202126%
Town of Bedford.....	50,282,391	3.548819%
Town of Billerica.....	143,712,635	10.142919%
Town of Boxborough.....	9,977,149	0.704165%
Town of Burlington.....	114,929,674	8.111481%
Town of Carlisle.....	9,988,584	0.704972%
Town of Chelmsford.....	100,190,226	7.071204%
Town of Dracut.....	57,818,789	4.080722%
Town of Dunstable.....	2,199,339	0.155224%
Town of Groton.....	22,421,400	1.582453%
Town of Holliston.....	24,188,374	1.707162%
Town of Hopkinton.....	21,332,499	1.505600%
Town of Hudson.....	62,417,388	4.405281%
Town of Lincoln.....	25,563,964	1.804248%
Town of Littleton.....	23,959,114	1.690981%
Town of North Reading.....	47,493,109	3.351958%
Town of Pepperell.....	16,537,163	1.167156%
Town of Sherborn.....	10,736,551	0.757762%
Town of Shirley.....	8,912,285	0.629009%
Town of Stow.....	10,493,658	0.740619%
Town of Sudbury.....	56,372,784	3.978666%
Town of Tewksbury.....	93,491,923	6.598452%
Town of Townsend.....	9,167,760	0.647040%
Town of Tyngsborough.....	22,745,937	1.605358%
Town of Wayland.....	55,492,666	3.916549%
Town of Westford.....	52,904,581	3.733888%
Town of Weston.....	63,418,247	4.475919%
Town of Wilmington.....	82,103,885	5.794710%
Acton-Boxborough Regional School District.....	27,434,445	1.936262%
Acton Water Supply.....	3,319,310	0.234270%
Bedford Housing Authority.....	312,414	0.022049%
Billerica Housing Authority.....	1,343,792	0.094842%
Chelmsford Housing Authority.....	1,193,547	0.084235%
Chelmsford Water District.....	1,165,154	0.082234%
Dracut Housing Authority.....	1,903,315	0.134332%
Dracut Water Supply.....	2,550,634	0.180018%
East Chelmsford Water District.....	321,683	0.022704%
East Middlesex Mosquito Control.....	585,986	0.041358%
Greater Lowell Regional Vocational Technical School District.....	14,939,992	1.054431%
Groton-Dunstable Regional School District.....	10,353,378	0.730718%
Hudson Housing Authority.....	1,432,356	0.101093%
Lincoln-Sudbury Regional School District.....	8,168,982	0.576549%
Nashoba Valley Technical High School District.....	3,254,718	0.229711%
North Chelmsford Water District.....	707,192	0.049912%
North Middlesex Regional School District.....	11,779,471	0.831369%
Shawshen Valley Regional Vocational School.....	8,457,396	0.596904%
South Middlesex Regional Vocational Technical School.....	7,274,785	0.513435%
Sudbury Water District.....	2,003,371	0.141393%
Tewksbury Housing Authority.....	1,495,958	0.105581%
Wayland Housing Authority.....	609,217	0.042997%
Hopkinton Housing Authority.....	514,197	0.036291%
Sudbury Housing Authority.....	367,971	0.025971%
Wilmington Housing Authority.....	319,057	0.022518%
Acton Housing Authority.....	990,778	0.069927%
Burlington Housing Authority.....	54,061	0.003816%
Ayer Housing Authority.....	1,891,747	0.133515%
Holliston Housing Authority.....	226,087	0.015957%
Littleton Housing Authority.....	454,776	0.032097%
Westford Housing Authority.....	478,025	0.033735%
Shirley Water District.....	359,871	0.025399%
Tyngsborough Housing Authority.....	455,142	0.032123%
Pepperell Housing Authority.....	159,347	0.011246%
Groton Housing Authority.....	13,516	0.000854%
Tyngsborough Water District.....	405,503	0.028620%
North Reading Housing Authority.....	147,057	0.010379%
West Groton Water.....	13,002	0.000918%
Ayer-Shirley Regional School District.....	4,668,086	0.329463%
Total.....	\$ 1,416,876,555	100.000%

See notes to schedule of employer allocations and schedule of pension amounts by employer.

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability.....	\$ -	\$ -	\$ -	\$ 44,369,446
Ending net pension liability.....	\$ -	\$ -	\$ -	\$ 45,680,759
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 205,732
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	1,896,570
Changes of assumptions.....	-	-	-	2,488,985
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	177,428
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 4,768,715
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	2,216,755
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 2,216,755
Pension Expense				
Proportionate share of plan pension expense.....	\$ 331,856	\$ -	\$ -	\$ 5,060,684
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(505,394)
Total Employer Pension Expense.....	\$ 331,856	\$ -	\$ -	\$ 4,555,290
Contributions				
Statutory required contribution.....	\$ 331,856	\$ -	\$ -	\$ 3,462,510
Contribution in relation to statutory required contribution.....	(331,856)	-	-	(3,462,510)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.13%	0.00%	0.00%	26.59%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2018.....	\$ -	\$ -	\$ -	\$ 785,197
June 30, 2019.....	-	-	-	785,197
June 30, 2020.....	-	-	-	752,488
June 30, 2021.....	-	-	-	229,078
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 2,551,960
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ -	\$ -	\$ -	\$ 55,163,653
Current discount rate (7.75%).....	\$ -	\$ -	\$ -	\$ 45,680,759
1% increase (8.75%).....	\$ -	\$ -	\$ -	\$ 37,666,402
Covered Payroll.....	\$ 1,320,310	\$ -	\$ -	\$ 13,020,403
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability.....	\$ 1,611,292	\$ 26,910,611	\$ 17,086,573	\$ 47,296,776
Ending net pension liability.....	\$ 1,387,848	\$ 31,797,911	\$ 17,032,643	\$ 50,282,391
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 6,250	\$ 143,208	\$ 76,710	\$ 226,456
Net difference between projected and actual investment earnings on pension plan investments.....	57,620	1,320,182	707,159	2,087,618
Changes of assumptions.....	75,619	1,732,556	928,049	2,739,710
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>122,130</u>	<u>2,033,650</u>	<u>214,679</u>	<u>62,623</u>
Total Deferred Outflows of Resources.....	<u>\$ 261,619</u>	<u>\$ 5,229,596</u>	<u>\$ 1,926,597</u>	<u>\$ 5,116,407</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>263,980</u>	<u>-</u>	<u>1,198,726</u>	<u>1,309,434</u>
Total Deferred Inflows of Resources.....	<u>\$ 263,980</u>	<u>\$ -</u>	<u>\$ 1,198,726</u>	<u>\$ 1,309,434</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 153,755	\$ 3,522,693	\$ 1,886,942	\$ 5,570,482
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(29,872)</u>	<u>545,326</u>	<u>(237,881)</u>	<u>(314,827)</u>
Total Employer Pension Expense.....	<u>\$ 123,883</u>	<u>\$ 4,068,019</u>	<u>\$ 1,649,061</u>	<u>\$ 5,255,655</u>
Contributions				
Statutory required contribution.....	\$ 173,361	\$ 2,417,928	\$ 1,429,491	\$ 3,715,207
Contribution in relation to statutory required contribution.....	<u>(173,361)</u>	<u>(2,447,482)</u>	<u>(1,429,491)</u>	<u>(3,715,207)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ (29,554)</u>	<u>\$ -</u>	<u>\$ -</u>
Contributions as a percentage of covered payroll.....	19.43%	21.31%	26.88%	20.47%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 9,338	\$ 1,443,693	\$ 243,332	\$ 1,105,770
June 30, 2019.....	9,338	1,443,693	243,332	1,105,770
June 30, 2020.....	8,341	1,420,930	231,138	1,069,780
June 30, 2021.....	<u>(29,378)</u>	<u>921,280</u>	<u>10,069</u>	<u>525,653</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ (2,361)</u>	<u>\$ 5,229,596</u>	<u>\$ 727,871</u>	<u>\$ 3,806,973</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 1,675,949	\$ 38,398,865	\$ 20,568,461	\$ 60,720,543
Current discount rate (7.75%).....	\$ 1,387,848	\$ 31,797,911	\$ 17,032,643	\$ 50,282,391
1% increase (8.75%).....	\$ 1,144,358	\$ 26,219,204	\$ 14,044,390	\$ 41,460,712
Covered Payroll.....	\$ 892,435	\$ 11,348,608	\$ 5,317,592	\$ 18,150,929
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability.....	\$ 127,076,615	\$ 7,963,070	\$ 104,556,462	\$ 8,912,755
Ending net pension liability.....	\$ 143,712,635	\$ 9,977,149	\$ 114,929,674	\$ 9,988,584
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 647,236	\$ 44,934	\$ 517,607	\$ 44,985
Net difference between projected and actual investment earnings on pension plan investments.....	5,966,645	414,230	4,771,637	414,705
Changes of assumptions.....	7,830,394	543,620	6,262,112	544,243
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>2,861,413</u>	<u>905,686</u>	<u>63,150</u>	<u>430,628</u>
Total Deferred Outflows of Resources.....	\$ <u>17,305,688</u>	\$ <u>1,908,470</u>	\$ <u>11,614,506</u>	\$ <u>1,434,561</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>2,084,460</u>	<u>64,434</u>	<u>715,135</u>	<u>-</u>
Total Deferred Inflows of Resources.....	\$ <u>2,084,460</u>	\$ <u>64,434</u>	\$ <u>715,135</u>	\$ <u>-</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 15,921,038	\$ 1,105,307	\$ 12,732,350	\$ 1,106,575
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>87,166</u>	<u>214,879</u>	<u>(205,684)</u>	<u>127,553</u>
Total Employer Pension Expense.....	\$ <u>16,008,204</u>	\$ <u>1,320,186</u>	\$ <u>12,526,666</u>	\$ <u>1,234,128</u>
Contributions				
Statutory required contribution.....	\$ 9,826,635	\$ 671,055	\$ 8,404,267	\$ 820,032
Contribution in relation to statutory required contribution.....	<u>(9,826,635)</u>	<u>(671,055)</u>	<u>(8,404,267)</u>	<u>(820,032)</u>
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	29.42%	23.93%	26.80%	16.07%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 4,147,390	\$ 496,757	\$ 3,041,353	\$ 409,754
June 30, 2019.....	4,147,390	496,757	3,041,353	409,754
June 30, 2020.....	4,044,517	489,612	2,959,083	402,606
June 30, 2021.....	<u>2,881,931</u>	<u>360,910</u>	<u>1,857,582</u>	<u>212,447</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>15,221,228</u>	\$ <u>1,844,036</u>	\$ <u>10,899,371</u>	\$ <u>1,434,561</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 173,546,042	\$ 12,048,313	\$ 138,788,012	\$ 12,062,121
Current discount rate (7.75%).....	\$ 143,712,635	\$ 9,977,149	\$ 114,929,674	\$ 9,988,584
1% increase (8.75%).....	\$ 118,499,309	\$ 8,226,732	\$ 94,766,111	\$ 8,236,160
Covered Payroll.....	\$ 33,403,976	\$ 2,804,223	\$ 31,361,657	\$ 5,103,107
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability.....	\$ 93,051,442	\$ 52,368,527	\$ 2,389,144	\$ 20,586,198
Ending net pension liability.....	\$ 100,190,226	\$ 57,818,789	\$ 2,199,339	\$ 22,421,400
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 451,225	\$ 260,397	\$ 9,905	\$ 100,979
Net difference between projected and actual investment earnings on pension plan investments.....	4,159,687	2,400,514	91,312	930,889
Changes of assumptions.....	5,459,012	3,150,342	119,834	1,221,663
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,758	246,996	89,707	209,922
Total Deferred Outflows of Resources.....	\$ 10,073,682	\$ 6,058,249	\$ 310,758	\$ 2,463,453
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,304,447	139,088	293,604	325,239
Total Deferred Inflows of Resources.....	\$ 2,304,447	\$ 139,088	\$ 293,604	\$ 325,239
Pension Expense				
Proportionate share of plan pension expense.....	\$ 11,099,452	\$ 6,405,383	\$ 243,657	\$ 2,483,925
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(651,330)	26,790	(47,699)	(37,541)
Total Employer Pension Expense.....	\$ 10,448,122	\$ 6,432,173	\$ 195,958	\$ 2,446,384
Contributions				
Statutory required contribution.....	\$ 7,552,208	\$ 4,233,672	\$ 228,686	\$ 1,839,040
Contribution in relation to statutory required contribution.....	(7,552,208)	(4,233,672)	(228,686)	(1,839,040)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	32.37%	29.23%	19.23%	26.08%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2018.....	\$ 2,179,282	\$ 1,660,308	\$ 14,437	\$ 595,917
June 30, 2019.....	2,179,283	1,660,309	14,437	595,917
June 30, 2020.....	2,107,562	1,618,920	12,862	579,869
June 30, 2021.....	1,303,108	979,624	(24,582)	366,511
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 7,769,235	\$ 5,919,161	\$ 17,154	\$ 2,138,214
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 120,988,799	\$ 69,821,441	\$ 2,655,894	\$ 27,075,882
Current discount rate (7.75%).....	\$ 100,190,226	\$ 57,818,789	\$ 2,199,339	\$ 22,421,400
1% increase (8.75%).....	\$ 82,612,596	\$ 47,674,914	\$ 1,813,476	\$ 18,487,736
Covered Payroll.....	\$ 23,331,173	\$ 14,484,571	\$ 1,189,485	\$ 7,051,413
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability.....	\$ 23,403,449	\$ 19,499,185	\$ 56,963,462	\$ 23,666,611
Ending net pension liability.....	\$ 24,188,374	\$ 21,332,499	\$ 62,417,388	\$ 25,563,964
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 108,937	\$ 96,075	\$ 281,108	\$ 115,132
Net difference between projected and actual investment earnings on pension plan investments.....	1,004,250	885,680	2,591,438	1,061,362
Changes of assumptions.....	1,317,939	1,162,332	3,400,903	1,392,890
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>567,559</u>	<u>1,113,291</u>	<u>176,123</u>	<u>179,315</u>
Total Deferred Outflows of Resources.....	\$ <u>2,998,685</u>	\$ <u>3,257,378</u>	\$ <u>6,449,572</u>	\$ <u>2,748,699</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>1,048,263</u>	<u>58,200</u>	<u>114,625</u>	<u>313,724</u>
Total Deferred Inflows of Resources.....	\$ <u>1,048,263</u>	\$ <u>58,200</u>	\$ <u>114,625</u>	\$ <u>313,724</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,679,678	\$ 2,363,301	\$ 6,914,833	\$ 2,832,071
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(89,025)</u>	<u>341,256</u>	<u>30,051</u>	<u>(19,793)</u>
Total Employer Pension Expense.....	\$ <u>2,590,653</u>	\$ <u>2,704,557</u>	\$ <u>6,944,884</u>	\$ <u>2,812,278</u>
Contributions				
Statutory required contribution.....	\$ 1,978,920	\$ 1,836,364	\$ 4,686,376	\$ 1,922,136
Contribution in relation to statutory required contribution.....	<u>(2,064,334)</u>	<u>(1,836,364)</u>	<u>(4,686,376)</u>	<u>(1,922,136)</u>
Contribution deficiency/(excess).....	\$ <u>(85,414)</u>	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	19.22%	13.67%	21.97%	20.30%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 594,354	\$ 943,950	\$ 1,793,492	\$ 702,450
June 30, 2019.....	594,354	943,950	1,793,492	702,450
June 30, 2020.....	577,040	928,683	1,748,811	684,148
June 30, 2021.....	<u>184,674</u>	<u>382,595</u>	<u>999,152</u>	<u>345,927</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>1,950,422</u>	\$ <u>3,199,178</u>	\$ <u>6,334,947</u>	\$ <u>2,434,975</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 29,209,662	\$ 25,760,922	\$ 75,374,669	\$ 30,870,811
Current discount rate (7.75%).....	\$ 24,188,374	\$ 21,332,499	\$ 62,417,388	\$ 25,563,964
1% increase (8.75%).....	\$ 19,944,706	\$ 17,589,865	\$ 51,466,724	\$ 21,078,958
Covered Payroll.....	\$ 10,294,366	\$ 13,435,811	\$ 21,333,104	\$ 9,468,363
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability.....	\$ 21,397,309	\$ 44,145,145	\$ 12,706,598	\$ 10,262,053
Ending net pension liability.....	\$ 23,959,114	\$ 47,493,109	\$ 16,537,163	\$ 10,736,551
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 107,904	\$ 213,894	\$ 74,478	\$ 48,354
Net difference between projected and actual investment earnings on pension plan investments.....	994,732	1,971,813	686,588	445,759
Changes of assumptions.....	1,305,448	2,587,732	901,051	584,997
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>1,540,528</u>	<u>-</u>	<u>1,952,591</u>	<u>130,400</u>
Total Deferred Outflows of Resources.....	<u>\$ 3,948,612</u>	<u>\$ 4,773,439</u>	<u>\$ 3,614,708</u>	<u>\$ 1,209,510</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>-</u>	<u>994,412</u>	<u>136,759</u>	<u>369,567</u>
Total Deferred Inflows of Resources.....	<u>\$ -</u>	<u>\$ 994,412</u>	<u>\$ 136,759</u>	<u>\$ 369,567</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,654,283	\$ 5,261,471	\$ 1,832,053	\$ 1,189,436
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>435,791</u>	<u>(269,018)</u>	<u>467,999</u>	<u>(53,712)</u>
Total Employer Pension Expense.....	<u>\$ 3,090,074</u>	<u>\$ 4,992,453</u>	<u>\$ 2,300,052</u>	<u>\$ 1,135,724</u>
Contributions				
Statutory required contribution.....	\$ 1,875,271	\$ 3,499,063	\$ 1,074,825	\$ 874,648
Contribution in relation to statutory required contribution.....	<u>(2,575,271)</u>	<u>(3,499,063)</u>	<u>(1,074,825)</u>	<u>(880,589)</u>
Contribution deficiency/(excess).....	<u>\$ (700,000)</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ (5,941)</u>
Contributions as a percentage of covered payroll.....	16.92%	27.22%	24.40%	21.81%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 1,112,694	\$ 1,072,775	\$ 935,213	\$ 249,621
June 30, 2019.....	1,112,693	1,072,775	935,213	249,621
June 30, 2020.....	1,095,538	1,038,782	923,379	241,939
June 30, 2021.....	<u>627,687</u>	<u>594,695</u>	<u>684,144</u>	<u>98,762</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 3,948,612</u>	<u>\$ 3,779,027</u>	<u>\$ 3,477,949</u>	<u>\$ 839,943</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 28,932,804	\$ 57,352,238	\$ 19,970,121	\$ 12,965,361
Current discount rate (7.75%).....	\$ 23,959,114	\$ 47,493,109	\$ 16,537,163	\$ 10,736,551
1% increase (8.75%).....	\$ 19,755,664	\$ 39,160,793	\$ 13,635,837	\$ 8,852,903
Covered Payroll.....	\$ 11,081,928	\$ 12,853,424	\$ 4,404,857	\$ 4,009,692
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability.....	\$ 9,134,041	\$ 9,234,186	\$ 51,874,232	\$ 85,301,248
Ending net pension liability.....	\$ 8,912,285	\$ 10,493,658	\$ 56,372,784	\$ 93,491,923
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 40,138	\$ 47,260	\$ 253,885	\$ 421,058
Net difference between projected and actual investment earnings on pension plan investments.....	370,019	435,674	2,340,479	3,881,587
Changes of assumptions.....	485,599	571,762	3,071,554	5,094,045
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	70,230	290,735	-	3,851
Total Deferred Outflows of Resources.....	\$ 965,986	\$ 1,345,431	\$ 5,665,918	\$ 9,400,541
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	800,253	39,601	1,015,336	1,149,751
Total Deferred Inflows of Resources.....	\$ 800,253	\$ 39,601	\$ 1,015,336	\$ 1,149,751
Pension Expense				
Proportionate share of plan pension expense.....	\$ 987,341	\$ 1,162,530	\$ 6,245,192	\$ 10,357,396
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(184,385)	66,263	(284,733)	(367,309)
Total Employer Pension Expense.....	\$ 802,956	\$ 1,228,793	\$ 5,960,459	\$ 9,990,087
Contributions				
Statutory required contribution.....	\$ 754,746	\$ 748,612	\$ 3,961,686	\$ 6,993,838
Contribution in relation to statutory required contribution.....	(754,746)	(748,612)	(3,961,686)	(6,993,838)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	37.63%	22.18%	25.97%	34.00%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 67,408	\$ 362,734	\$ 1,307,932	\$ 2,274,060
June 30, 2019.....	67,408	362,734	1,307,932	2,274,060
June 30, 2020.....	61,030	355,221	1,267,580	2,207,137
June 30, 2021.....	(30,113)	225,141	767,138	1,495,533
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 165,733	\$ 1,305,830	\$ 4,650,582	\$ 8,250,790
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 10,762,388	\$ 12,672,043	\$ 68,075,256	\$ 112,899,979
Current discount rate (7.75%).....	\$ 8,912,285	\$ 10,493,658	\$ 56,372,784	\$ 93,491,923
1% increase (8.75%).....	\$ 7,348,687	\$ 8,652,622	\$ 46,482,597	\$ 77,089,453
Covered Payroll.....	\$ 2,005,444	\$ 3,375,342	\$ 15,254,095	\$ 20,571,433
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability.....	\$ 7,475,618	\$ 17,982,560	\$ 53,154,605	\$ 47,358,134
Ending net pension liability.....	\$ 9,167,760	\$ 22,745,937	\$ 55,492,666	\$ 52,904,581
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 41,289	\$ 102,440	\$ 249,921	\$ 238,265
Net difference between projected and actual investment earnings on pension plan investments.....	380,626	944,363	2,303,938	2,196,487
Changes of assumptions.....	499,519	1,239,346	3,023,599	2,882,584
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>836,372</u>	<u>2,340,683</u>	<u>138,717</u>	<u>1,682,233</u>
Total Deferred Outflows of Resources.....	<u>\$ 1,757,806</u>	<u>\$ 4,626,832</u>	<u>\$ 5,716,175</u>	<u>\$ 6,999,569</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>494</u>	<u>146,747</u>	<u>2,073,934</u>	<u>-</u>
Total Deferred Inflows of Resources.....	<u>\$ 494</u>	<u>\$ 146,747</u>	<u>\$ 2,073,934</u>	<u>\$ -</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,015,641	\$ 2,519,880	\$ 6,147,692	\$ 5,860,969
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>223,541</u>	<u>571,020</u>	<u>(482,325)</u>	<u>492,616</u>
Total Employer Pension Expense.....	<u>\$ 1,239,182</u>	<u>\$ 3,090,900</u>	<u>\$ 5,665,367</u>	<u>\$ 6,353,585</u>
Contributions				
Statutory required contribution.....	\$ 690,007	\$ 1,530,059	\$ 4,235,414	\$ 4,238,879
Contribution in relation to statutory required contribution.....	<u>(690,007)</u>	<u>(1,530,059)</u>	<u>(4,235,414)</u>	<u>(4,238,879)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Contributions as a percentage of covered payroll.....	24.08%	20.69%	23.45%	17.59%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 482,552	\$ 1,213,647	\$ 1,085,475	\$ 1,987,296
June 30, 2019.....	482,552	1,213,647	1,085,475	1,987,296
June 30, 2020.....	475,991	1,197,366	1,045,749	1,949,426
June 30, 2021.....	<u>316,217</u>	<u>855,425</u>	<u>425,542</u>	<u>1,075,551</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 1,757,312</u>	<u>\$ 4,480,085</u>	<u>\$ 3,642,241</u>	<u>\$ 6,999,569</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 11,070,900	\$ 27,467,789	\$ 67,012,430	\$ 63,887,087
Current discount rate (7.75%).....	\$ 9,167,760	\$ 22,745,937	\$ 55,492,666	\$ 52,904,581
1% increase (8.75%).....	\$ 7,559,343	\$ 18,755,334	\$ 45,756,887	\$ 43,622,866
Covered Payroll.....	\$ 2,866,064	\$ 7,396,732	\$ 18,058,289	\$ 24,100,833
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability.....	\$ 58,678,679	\$ 74,403,164	\$ 23,515,180	\$ 2,784,648
Ending net pension liability.....	\$ 63,418,247	\$ 82,103,885	\$ 27,434,445	\$ 3,319,310
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 285,616	\$ 369,770	\$ 123,556	\$ 14,949
Net difference between projected and actual investment earnings on pension plan investments.....	2,632,992	3,408,780	1,139,020	137,811
Changes of assumptions.....	3,455,436	4,473,551	1,494,806	180,858
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	280,816	1,284,273	198,888
Total Deferred Outflows of Resources.....	\$ 6,374,044	\$ 8,532,917	\$ 4,041,655	\$ 532,506
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,218,258	544,262	-	87,266
Total Deferred Inflows of Resources.....	\$ 1,218,258	\$ 544,262	\$ -	\$ 87,266
Pension Expense				
Proportionate share of plan pension expense.....	\$ 7,025,716	\$ 9,095,780	\$ 3,039,295	\$ 367,720
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(332,076)	(111,217)	334,242	27,005
Total Employer Pension Expense.....	\$ 6,693,640	\$ 8,984,563	\$ 3,373,537	\$ 394,725
Contributions				
Statutory required contribution.....	\$ 4,557,886	\$ 5,704,192	\$ 2,086,065	\$ 177,725
Contribution in relation to statutory required contribution.....	(4,557,886)	(6,204,192)	(2,086,065)	(177,725)
Contribution deficiency/(excess).....	\$ -	\$ (500,000)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	23.95%	26.61%	16.38%	15.64%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 1,459,641	\$ 2,208,413	\$ 1,109,330	\$ 120,784
June 30, 2019.....	1,459,641	2,208,413	1,109,330	120,784
June 30, 2020.....	1,414,243	2,149,642	1,089,689	118,406
June 30, 2021.....	822,261	1,422,187	733,306	85,266
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 5,155,786	\$ 7,988,655	\$ 4,041,655	\$ 445,240
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 76,583,290	\$ 99,147,897	\$ 33,129,579	\$ 4,008,376
Current discount rate (7.75%).....	\$ 63,418,247	\$ 82,103,885	\$ 27,434,445	\$ 3,319,310
1% increase (8.75%).....	\$ 52,291,984	\$ 67,699,368	\$ 22,621,272	\$ 2,736,967
Covered Payroll.....	\$ 19,031,657	\$ 21,440,286	\$ 12,732,786	\$ 1,136,133
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability.....	\$ 263,833	\$ 1,068,744	\$ 1,138,990	\$ 1,402,613
Ending net pension liability.....	\$ 312,414	\$ 1,343,792	\$ 1,193,547	\$ 1,165,154
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,407	\$ 6,052	\$ 5,375	\$ 5,247
Net difference between projected and actual investment earnings on pension plan investments.....	12,970	55,791	49,554	48,375
Changes of assumptions.....	17,022	73,219	65,032	63,485
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>23,971</u>	<u>117,805</u>	<u>46,456</u>	<u>1,135,948</u>
Total Deferred Outflows of Resources.....	<u>\$ 55,370</u>	<u>\$ 252,867</u>	<u>\$ 166,417</u>	<u>\$ 1,253,055</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>-</u>	<u>20,821</u>	<u>39,710</u>	<u>737,955</u>
Total Deferred Inflows of Resources.....	<u>\$ -</u>	<u>\$ 20,821</u>	<u>\$ 39,710</u>	<u>\$ 737,955</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 34,617	\$ 148,868	\$ 132,225	\$ 129,080
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>6,404</u>	<u>23,420</u>	<u>4,900</u>	<u>113,519</u>
Total Employer Pension Expense.....	<u>\$ 41,021</u>	<u>\$ 172,288</u>	<u>\$ 137,125</u>	<u>\$ 242,599</u>
Contributions				
Statutory required contribution.....	\$ 27,786	\$ 87,992	\$ 99,778	\$ 199,317
Contribution in relation to statutory required contribution.....	<u>(27,786)</u>	<u>(87,992)</u>	<u>(99,778)</u>	<u>(699,317)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ (500,000)</u>
Contributions as a percentage of covered payroll.....	24.44%	29.94%	6.73%	15.54%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 15,230	\$ 61,385	\$ 38,621	\$ 146,437
June 30, 2019.....	15,230	61,385	38,621	146,437
June 30, 2020.....	15,005	60,423	37,767	145,602
June 30, 2021.....	<u>9,905</u>	<u>48,853</u>	<u>11,698</u>	<u>76,624</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 55,370</u>	<u>\$ 232,046</u>	<u>\$ 126,707</u>	<u>\$ 515,100</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 377,260	\$ 1,622,753	\$ 1,441,318	\$ 1,407,030
Current discount rate (7.75%).....	\$ 312,414	\$ 1,343,792	\$ 1,193,547	\$ 1,165,154
1% increase (8.75%).....	\$ 257,598	\$ 1,108,035	\$ 984,149	\$ 960,737
Covered Payroll.....	\$ 113,686	\$ 293,891	\$ 1,482,827	\$ 1,282,932
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability.....	\$ 1,785,743	\$ 2,428,037	\$ 286,759	\$ 496,144
Ending net pension liability.....	\$ 1,903,315	\$ 2,550,634	\$ 321,683	\$ 585,986
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 8,572	\$ 11,487	\$ 1,449	\$ 2,639
Net difference between projected and actual investment earnings on pension plan investments.....	79,022	105,897	13,356	24,329
Changes of assumptions.....	103,705	138,975	17,528	31,929
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	17,575	63,052
Total Deferred Outflows of Resources.....	\$ 191,299	\$ 256,359	\$ 49,908	\$ 121,949
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	106,881	149,078	-	4,376
Total Deferred Inflows of Resources.....	\$ 106,881	\$ 149,078	\$ -	\$ 4,376
Pension Expense				
Proportionate share of plan pension expense.....	\$ 210,853	\$ 282,571	\$ 35,632	\$ 64,913
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(30,604)	(40,749)	5,344	17,500
Total Employer Pension Expense.....	\$ 180,249	\$ 241,822	\$ 40,976	\$ 82,413
Contributions				
Statutory required contribution.....	\$ 118,166	\$ 158,353	\$ 26,158	\$ 39,549
Contribution in relation to statutory required contribution.....	(118,166)	(158,353)	(26,158)	(39,549)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	38.89%	24.13%	13.60%	9.99%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 23,169	\$ 31,312	\$ 14,432	\$ 34,056
June 30, 2019.....	23,169	31,312	14,432	34,056
June 30, 2020.....	21,809	29,489	14,198	33,636
June 30, 2021.....	16,271	15,168	6,846	15,825
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 84,418	\$ 107,281	\$ 49,908	\$ 117,573
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 2,298,430	\$ 3,080,121	\$ 388,467	\$ 707,638
Current discount rate (7.75%).....	\$ 1,903,315	\$ 2,550,634	\$ 321,683	\$ 585,986
1% increase (8.75%).....	\$ 1,569,395	\$ 2,103,143	\$ 265,250	\$ 483,184
Covered Payroll.....	\$ 303,854	\$ 656,312	\$ 192,343	\$ 395,837
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Greater Lowell Regional Vocational Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability.....	\$ 14,784,348	\$ 8,509,375	\$ 1,399,262	\$ 7,913,832
Ending net pension liability.....	\$ 14,939,992	\$ 10,353,378	\$ 1,432,356	\$ 8,168,982
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 67,285	\$ 46,628	\$ 6,451	\$ 36,791
Net difference between projected and actual investment earnings on pension plan investments.....	620,277	429,850	59,469	339,159
Changes of assumptions.....	814,027	564,119	78,044	445,099
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	56,100	924,844	-	-
Total Deferred Outflows of Resources.....	\$ 1,557,689	\$ 1,965,441	\$ 143,964	\$ 821,049
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,016,814	22,077	108,729	456,759
Total Deferred Inflows of Resources.....	\$ 1,016,814	\$ 22,077	\$ 108,729	\$ 456,759
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,655,115	\$ 1,146,992	\$ 158,675	\$ 904,986
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(250,131)	244,745	(29,434)	(120,178)
Total Employer Pension Expense.....	\$ 1,404,984	\$ 1,391,737	\$ 129,241	\$ 784,808
Contributions				
Statutory required contribution.....	\$ 1,195,581	\$ 752,342	\$ 96,064	\$ 586,204
Contribution in relation to statutory required contribution.....	(1,195,581)	(752,342)	(96,064)	(586,204)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.03%	15.78%	29.48%	20.40%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 171,959	\$ 537,252	\$ 11,034	\$ 110,615
June 30, 2019.....	171,959	537,252	11,034	110,615
June 30, 2020.....	161,263	529,840	10,007	104,772
June 30, 2021.....	35,694	339,020	3,160	38,288
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 540,875	\$ 1,943,364	\$ 35,235	\$ 364,290
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 18,041,389	\$ 12,502,637	\$ 1,729,708	\$ 9,864,794
Current discount rate (7.75%).....	\$ 14,939,992	\$ 10,353,378	\$ 1,432,356	\$ 8,168,982
1% increase (8.75%).....	\$ 12,318,876	\$ 8,536,949	\$ 1,181,066	\$ 6,735,799
Covered Payroll.....	\$ 4,776,265	\$ 4,767,494	\$ 325,812	\$ 2,873,324
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability.....	\$ 3,156,315	\$ 748,681	\$ 10,991,588	\$ 7,364,846
Ending net pension liability.....	\$ 3,254,718	\$ 707,192	\$ 11,779,471	\$ 8,457,396
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 14,658	\$ 3,185	\$ 53,051	\$ 38,089
Net difference between projected and actual investment earnings on pension plan investments.....	135,129	29,361	489,059	351,133
Changes of assumptions.....	177,338	38,532	641,822	460,813
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	943	42,984	79,569	254,583
Total Deferred Outflows of Resources.....	\$ 328,068	\$ 114,062	\$ 1,263,501	\$ 1,104,618
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	226,151	99,673	209,457	143,320
Total Deferred Inflows of Resources.....	\$ 226,151	\$ 99,673	\$ 209,457	\$ 143,320
Pension Expense				
Proportionate share of plan pension expense.....	\$ 360,568	\$ 78,347	\$ 1,304,973	\$ 936,947
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(62,938)	(11,523)	(26,630)	21,349
Total Employer Pension Expense.....	\$ 297,630	\$ 66,824	\$ 1,278,343	\$ 958,296
Contributions				
Statutory required contribution.....	\$ 246,363	\$ 42,129	\$ 890,539	\$ 554,980
Contribution in relation to statutory required contribution.....	(246,363)	(42,129)	(890,539)	(554,980)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	27.65%	8.02%	19.20%	19.88%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2018.....	\$ 29,016	\$ 8,457	\$ 306,168	\$ 260,290
June 30, 2019.....	29,016	8,457	306,168	260,290
June 30, 2020.....	26,687	7,951	297,738	254,234
June 30, 2021.....	17,198	(10,476)	143,970	186,484
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 101,917	\$ 14,389	\$ 1,054,044	\$ 961,298
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 3,930,371	\$ 853,998	\$ 14,224,782	\$ 10,213,070
Current discount rate (7.75%).....	\$ 3,254,718	\$ 707,192	\$ 11,779,471	\$ 8,457,396
1% increase (8.75%).....	\$ 2,683,705	\$ 583,120	\$ 9,712,851	\$ 6,973,606
Covered Payroll.....	\$ 891,111	\$ 525,584	\$ 4,638,161	\$ 2,792,305
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 6,481,194	\$ 1,446,469	\$ 1,248,093	\$ 447,164
Ending net pension liability.....	\$ 7,274,785	\$ 2,003,371	\$ 1,495,958	\$ 609,217
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 32,763	\$ 9,023	\$ 6,737	\$ 2,744
Net difference between projected and actual investment earnings on pension plan investments.....	302,034	83,175	62,109	25,293
Changes of assumptions.....	396,377	109,156	81,509	33,194
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>108,222</u>	<u>295,530</u>	<u>88,470</u>	<u>98,444</u>
Total Deferred Outflows of Resources.....	<u>\$ 839,396</u>	<u>\$ 496,884</u>	<u>\$ 238,825</u>	<u>\$ 159,675</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>25,724</u>	<u>67,701</u>	<u>10,329</u>	<u>13,262</u>
Total Deferred Inflows of Resources.....	<u>\$ 25,724</u>	<u>\$ 67,701</u>	<u>\$ 10,329</u>	<u>\$ 13,262</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 805,931	\$ 221,948	\$ 165,733	\$ 67,494
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>20,161</u>	<u>56,228</u>	<u>19,307</u>	<u>22,490</u>
Total Employer Pension Expense.....	<u>\$ 826,092</u>	<u>\$ 278,176</u>	<u>\$ 185,040</u>	<u>\$ 89,984</u>
Contributions				
Statutory required contribution.....	\$ 523,099	\$ 88,372	\$ 105,697	\$ 32,430
Contribution in relation to statutory required contribution.....	<u>(523,099)</u>	<u>(88,372)</u>	<u>(105,697)</u>	<u>(32,430)</u>
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	20.69%	11.15%	25.48%	11.95%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 225,691	\$ 112,828	\$ 61,571	\$ 39,702
June 30, 2019.....	225,691	112,828	61,571	39,702
June 30, 2020.....	220,482	111,392	60,499	39,266
June 30, 2021.....	<u>141,808</u>	<u>92,135</u>	<u>44,855</u>	<u>27,743</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 813,672</u>	<u>\$ 429,183</u>	<u>\$ 228,496</u>	<u>\$ 146,413</u>
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 8,784,960	\$ 2,419,244	\$ 1,806,498	\$ 735,682
Current discount rate (7.75%).....	\$ 7,274,785	\$ 2,003,371	\$ 1,495,958	\$ 609,217
1% increase (8.75%).....	\$ 5,998,476	\$ 1,651,889	\$ 1,233,499	\$ 502,332
Covered Payroll.....	\$ 2,528,429	\$ 792,652	\$ 414,768	\$ 271,439
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 442,908	\$ 266,258	\$ 271,567	\$ 827,882
Ending net pension liability.....	\$ 514,197	\$ 367,971	\$ 319,057	\$ 990,778
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,316	\$ 1,657	\$ 1,437	\$ 4,462
Net difference between projected and actual investment earnings on pension plan investments.....	21,348	15,278	13,246	41,135
Changes of assumptions.....	28,017	20,050	17,384	53,984
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	32,086	65,366	16,988	67,635
Total Deferred Outflows of Resources.....	\$ 83,767	\$ 102,351	\$ 49,055	\$ 167,216
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	8,952	2,793	659	4,162
Total Deferred Inflows of Resources.....	\$ 8,952	\$ 2,793	\$ 659	\$ 4,162
Pension Expense				
Proportionate share of plan pension expense.....	\$ 56,964	\$ 40,759	\$ 35,352	\$ 109,761
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	6,596	16,740	4,185	16,810
Total Employer Pension Expense.....	\$ 63,560	\$ 57,499	\$ 39,537	\$ 126,571
Contributions				
Statutory required contribution.....	\$ 31,500	\$ 24,229	\$ 24,960	\$ 69,434
Contribution in relation to statutory required contribution.....	(31,500)	(24,229)	(24,960)	(69,434)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	46.45%	25.00%	19.43%	19.18%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 21,123	\$ 27,136	\$ 13,199	\$ 44,802
June 30, 2019.....	21,123	27,136	13,199	44,802
June 30, 2020.....	20,756	26,871	12,970	44,092
June 30, 2021.....	11,813	18,415	9,028	29,358
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 74,815	\$ 99,558	\$ 48,396	\$ 163,054
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 620,942	\$ 444,366	\$ 385,285	\$ 1,196,456
Current discount rate (7.75%).....	\$ 514,197	\$ 367,971	\$ 319,057	\$ 990,778
1% increase (8.75%).....	\$ 423,986	\$ 303,418	\$ 263,077	\$ 816,954
Covered Payroll.....	\$ 67,814	\$ 96,925	\$ 128,435	\$ 362,090

See notes to schedule of employer allocations and schedule of pension amounts by employer.

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 119,574	\$ 441,841	\$ 214,474	\$ 367,115
Ending net pension liability.....	\$ 54,061	\$ 1,891,747	\$ 226,087	\$ 454,776
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 244	\$ 8,520	\$ 1,018	\$ 2,048
Net difference between projected and actual investment earnings on pension plan investments.....	2,245	78,541	9,387	18,881
Changes of assumptions.....	2,946	103,074	12,319	24,779
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	44,837	982,492	13,186	36,372
Total Deferred Outflows of Resources.....	\$ 50,272	\$ 1,172,627	\$ 35,910	\$ 82,080
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	53,408	84,855	6,549	9,770
Total Deferred Inflows of Resources.....	\$ 53,408	\$ 84,855	\$ 6,549	\$ 9,770
Pension Expense				
Proportionate share of plan pension expense.....	\$ 5,982	\$ 209,579	\$ 25,044	\$ 50,384
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	817	224,363	2,472	6,097
Total Employer Pension Expense.....	\$ 6,799	\$ 433,942	\$ 27,516	\$ 56,481
Contributions				
Statutory required contribution.....	\$ 15,711	\$ 49,993	\$ 21,320	\$ 31,258
Contribution in relation to statutory required contribution.....	(15,711)	(49,993)	(21,320)	(31,258)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	14.75%	45.65%	38.36%	43.95%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2018.....	\$ 2,345	\$ 277,809	\$ 8,860	\$ 18,945
June 30, 2019.....	2,345	277,809	8,860	18,945
June 30, 2020.....	2,310	276,459	8,701	18,624
June 30, 2021.....	(10,136)	255,695	2,940	15,796
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (3,136)	\$ 1,087,772	\$ 29,361	\$ 72,310
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 65,292	\$ 2,284,451	\$ 273,025	\$ 549,182
Current discount rate (7.75%).....	\$ 54,061	\$ 1,891,747	\$ 226,087	\$ 454,776
1% increase (8.75%).....	\$ 44,582	\$ 1,559,850	\$ 186,425	\$ 374,988
Covered Payroll.....	\$ 106,507	\$ 109,512	\$ 55,583	\$ 71,123
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 427,017	\$ 358,461	\$ 399,306	\$ 100,348
Ending net pension liability.....	\$ 478,025	\$ 359,871	\$ 455,142	\$ 159,347
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,153	\$ 1,621	\$ 2,050	\$ 718
Net difference between projected and actual investment earnings on pension plan investments.....	19,847	14,941	18,897	6,616
Changes of assumptions.....	26,046	19,608	24,799	8,682
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	14,836	9,640	12,013	36,509
Total Deferred Outflows of Resources.....	\$ 62,882	\$ 45,810	\$ 57,759	\$ 52,525
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	35,526	9,841	2,024
Total Deferred Inflows of Resources.....	\$ -	\$ 35,526	\$ 9,841	\$ 2,024
Pension Expense				
Proportionate share of plan pension expense.....	\$ 52,956	\$ 39,867	\$ 50,421	\$ 17,657
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,317	(6,158)	(186)	8,832
Total Employer Pension Expense.....	\$ 57,273	\$ 33,709	\$ 50,235	\$ 26,489
Contributions				
Statutory required contribution.....	\$ 37,649	\$ 19,279	\$ 33,609	\$ 9,474
Contribution in relation to statutory required contribution.....	(37,649)	(19,279)	(33,609)	(9,474)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	34.37%	10.01%	22.36%	11.10%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2018.....	\$ 17,822	\$ 4,009	\$ 12,673	\$ 13,334
June 30, 2019.....	17,822	4,009	12,673	13,334
June 30, 2020.....	17,479	3,753	12,346	13,224
June 30, 2021.....	9,759	(1,487)	10,226	10,609
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 62,882	\$ 10,284	\$ 47,918	\$ 50,501
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 577,260	\$ 434,579	\$ 549,627	\$ 192,420
Current discount rate (7.75%).....	\$ 478,025	\$ 359,871	\$ 455,142	\$ 159,347
1% increase (8.75%).....	\$ 394,160	\$ 296,736	\$ 375,292	\$ 131,387
Covered Payroll.....	\$ 109,535	\$ 192,611	\$ 150,333	\$ 85,370
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability.....	\$ 12,029	\$ 372,014	\$ 84,100	\$ 24,760
Ending net pension liability.....	\$ 13,516	\$ 405,503	\$ 147,057	\$ 13,002
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 61	\$ 1,826	\$ 662	\$ 59
Net difference between projected and actual investment earnings on pension plan investments.....	561	16,836	6,106	540
Changes of assumptions.....	736	22,095	8,013	709
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,983	11,979	41,405	13,603
Total Deferred Outflows of Resources.....	\$ 5,341	\$ 52,736	\$ 56,186	\$ 14,911
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	3,087	178	9,808
Total Deferred Inflows of Resources.....	\$ -	\$ 3,087	\$ 178	\$ 9,808
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,497	\$ 44,918	\$ 16,290	\$ 1,436
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,221	3,187	10,605	1,758
Total Employer Pension Expense.....	\$ 2,718	\$ 48,105	\$ 26,895	\$ 3,194
Contributions				
Statutory required contribution.....	\$ 2,363	\$ 29,869	\$ 10,855	\$ 5,849
Contribution in relation to statutory required contribution.....	(2,363)	(29,869)	(10,855)	(5,849)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	8.61%	15.46%	11.61%	5.16%
Deferred Outflows/(Inflows) Recognized in				
Future Pension Expense				
June 30, 2018.....	\$ 1,603	\$ 14,644	\$ 14,760	\$ 2,125
June 30, 2019.....	1,603	14,644	14,760	2,125
June 30, 2020.....	1,593	14,351	14,657	2,116
June 30, 2021.....	542	6,010	11,831	(1,263)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 5,341	\$ 49,649	\$ 56,008	\$ 5,103
Discount Rate Sensitivity				
1% decrease (6.75%).....	\$ 16,323	\$ 489,690	\$ 177,585	\$ 15,707
Current discount rate (7.75%).....	\$ 13,516	\$ 405,503	\$ 147,057	\$ 13,002
1% increase (8.75%).....	\$ 11,146	\$ 334,366	\$ 121,257	\$ 10,725
Covered Payroll.....	\$ 27,446	\$ 193,260	\$ 93,493	\$ 113,366
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2016

	Ayer-Shirley Regional School District	Totals
Net Pension Liability		
Beginning net pension liability.....	\$ 4,808,243	\$ 1,290,018,945
Ending net pension liability.....	\$ 4,668,086	\$ 1,416,876,555
Deferred Outflows of Resources		
Differences between expected and actual experience.....	\$ 21,024	\$ 6,381,162
Net difference between projected and actual investment earnings on pension plan investments.....	193,809	58,825,722
Changes of assumptions.....	254,347	77,200,603
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	175,100	25,140,901
Total Deferred Outflows of Resources.....	\$ 644,280	\$ 167,548,388
Deferred Inflows of Resources		
Differences between expected and actual experience.....	\$ -	\$ -
Changes of assumptions.....	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	423,718	25,140,901
Total Deferred Inflows of Resources.....	\$ 423,718	\$ 25,140,901
Pension Expense		
Proportionate share of plan pension expense.....	\$ 517,150	\$ 157,298,862
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(52,513)	-
Total Employer Pension Expense.....	\$ 464,637	\$ 157,298,862
Contributions		
Statutory required contribution.....	\$ 425,887	\$ 105,246,798
Contribution in relation to statutory required contribution.....	(425,887)	(107,067,707)
Contribution deficiency/(excess).....	\$ -	\$ (1,820,909)
Contributions as a percentage of covered payroll.....	11.41%	23.94%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense		
June 30, 2018.....	\$ 79,371	\$ 40,030,134
June 30, 2019.....	79,371	40,030,135
June 30, 2020.....	76,031	39,015,901
June 30, 2021.....	(14,211)	23,331,317
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 220,562	\$ 142,407,487
Discount Rate Sensitivity		
1% decrease (6.75%).....	\$ 5,637,135	\$ 1,711,007,052
Current discount rate (7.75%).....	\$ 4,668,086	\$ 1,416,876,555
1% increase (8.75%).....	\$ 3,849,103	\$ 1,168,296,041
Covered Payroll.....	\$ 3,731,372	\$ 439,644,322
See notes to schedule of employer allocations and schedule of pension amounts by employer.		(Concluded)

NOTE I – Schedule of Employer Allocations

Governmental Accounting Standards Board (GASB) Statement #68 requires employers participating in a cost-sharing pension plan to recognize pension liabilities as employees provide services to the government and earn their pension benefits. Employers participating in cost-sharing plans are required to recognize their proportionate share of the plan's collective pension amounts for all benefits provided through the plan including the net pension liability, deferred outflows of resources, deferred inflows of resources, pension expense, and contributions.

GASB Statement #68 requires the allocation of the collective pension amounts be consistent with the manner in which contributions to the plan are determined. As permissible under GASB Statement #68, The Schedule of Employer Allocations is used to demonstrate the allocation of Middlesex County Retirement System's collective pension amounts.

Massachusetts General Law (MGL) Chapter 32 Section 22 Paragraph 7c dictates that Massachusetts cost sharing defined benefit pension plans allocate the annual required pension fund appropriation to employer units based on their proportionate share of the aggregate of the annual rates of regular compensation of all members in service of the system. The Public Employee Retirement Administration Commission (PERAC) approves each system's proportionate share of the annual required contribution. PERAC can accept alternative allocation methodologies and as such the System has elected to use an actuarial based allocation methodology. Accordingly, the each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the System's net position at year end is calculated by starting with the balance carried forward from the prior year. Each member unit is then credited with the actual required contribution received during the year along with any excess contributions received. Each member unit's share is reduced by the actual payment made to their specific retirees. Net investment income is allocated based on each member's money-weighted rate of return. All other shared expenses are allocated based the proportionate share of the total pension liability. The difference between the total pension liability and the net position is reported as the net pension liability.

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County and Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2016, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the System's funding schedule. No assets have been allocated to cover the remaining liability and therefore the liability has been allocated to the remaining member units.

The current employees, retirees, beneficiaries and inactive participants of the Middlesex County Retirement System have been identified and their total pension liability has been actuarially determined. For transparency purposes, the System has historically paid a contribution as an employer to itself. However with the implementation of GASB 67 & 68 the net pension liability is allocated to each member unit.

When a member unit accepts an Early Retirement Incentive Program (E.R.I. or ERIP), PERAC completes an analysis of the costs and liabilities attributable to the additional benefits payable in accordance with the ERIP. The accrued liability for the members who accept the ERIP as retirees including the ERIP less the accrued liability for the members as active employees excluding the ERIP represents the increase in accrued liability due to the ERIP. The net increase is amortized for each member unit accepting the ERIP, and is separately identified in the system's funding schedule. The 2002 ERIP amortization is straight line ending in fiscal 2019. The 2003 ERIP

amortization is straight line ending in fiscal 2020. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE II – Schedule of Pension Amounts by Employer

The Schedule of Pension Amounts by Employer presents the net pension liability, the various categories of deferred outflows of resources and deferred inflows of resources, contributions and pension expense for all participating employers including differences between expected and actual economic experience; differences between projected and actual investment earnings, net; and changes of assumptions.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2015

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2015

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Financial Section



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

Report on the Financial Statements

We have audited the accompanying financial statements of Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2015, and the related notes to the financial statements, which collectively comprise the Middlesex County Retirement System's financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Middlesex County Retirement System as of December 31, 2015 and the results of its operations and changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis; the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Return be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated August 22, 2016, on our consideration of the Middlesex County Retirement System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Middlesex County Retirement System's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System, the Public Employee Retirement Administration Commission and all member units and is not intended to be and should not be used by anyone other than these specified parties.



August 29, 2016

Management's Discussion and Analysis

As management of the Middlesex County Retirement System, we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2015. The System complies with financial reporting requirements issued by the Governmental Accounting Standards Board (GASB).

The GASB is the authoritative standard setting body that provides guidance on how to prepare financial statements in conformity with generally accepted accounting principles (GAAP). Users of these financial statements rely on the GASB to establish consistent reporting standards for all governments in the United States. This consistent application is the only way users can assess the financial condition of a public retirement system compared to others.

Financial Highlights

- The System's assets exceeded its liabilities at the close of the most recent year by \$1.1 billion (net position).
- The System's net position increased by \$10.9 million for the year ended December 31, 2015.
- Total investment income was \$13.2 million; investment expenses were \$5.5 million; and net investment income was \$7.7 million.
- Total contributions were \$148.7 million, primarily consisting of \$99.8 million from employers and \$45.9 from members.
- Retirement benefits, refunds and transfers amounted to \$142.3 million.
- Administrative expenses were \$2.8 million or 2% of total deductions.
- The Total Pension Liability is \$2.4 billion as of December 31, 2015 while the Net Pension Liability is \$1.3 billion.
- The Plan fiduciary net position as a percentage of the total pension liability is 46.13%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the System fiduciary financial statements. These fiduciary financial statements comprise of four components: 1) management's discussion and analysis, 2) fiduciary financial statements, 3) notes to the financial statements and 4) required supplementary information.

Fiduciary Financial Statements

The *statement of net position* presents information on all assets and deferred outflows less deferred inflows and liabilities with the difference reported as *net position*. Over time, increases or decreases in net position may serve as a useful indicator of whether the financial position is improving or deteriorating.

The *statement of changes in fiduciary net position* presents information showing how the system's net position changed during the most recent year. All changes in net position are reported as soon as the underlying event giving rise to the change occurs, *regardless of the timing of related cash flows*. Thus, additions and deductions are reported in this statement for some items that will only result in cash flows in future periods.

Notes to the financial statements

The notes provide additional information that is essential to a full understanding of the data provided in the fiduciary financial statements.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Return be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context.

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the System's financial position. The System's net position exceeded liabilities by \$1.1 billion at the close of 2015.

The assets accumulated are held to provide pension benefits for qualified retirees along with active and inactive employees of the member units. At year end the system's net position include investments of \$1.0 billion, cash of \$48.4 million and current accounts receivable of \$4.7 million. The system also had capital assets, net of accumulated depreciation of \$5.6 million at year-end primarily consisting of land, an office building, and building improvements.

In 2015 the System's contributions were \$148.7 million while retirement benefit payments, refunds, transfers and administration expenses were \$145.6 million which resulted in a current surplus of \$3.1 million. In 2014 the System's contributions were \$138.8 million while retirement benefit payments, refunds, transfers and administration expenses were \$134.2 million which resulted in a prior year surplus of \$4.6 million. Therefore for these two years the System was able to sustain operations independent of investment income.

The main change between 2014 in the increase in net position relates to each year's investment performance. Net investment income was \$7.6 million and \$74.9 million in 2015 and 2014 respectively. The annual money weighted rate of return was 0.61% and 7.54% in 2015 and 2014 respectively. The system's investment policy is designed to achieve a long-term rate of return of 7.875% and fluctuation in annual investment returns is expected.

The following tables present summarized financial information for the past two years.

Condensed Statement of Fiduciary Net Position

	2015	2014
Assets:		
Cash.....	\$ 48,386,377	\$ 52,174,629
Investments.....	1,045,843,118	1,028,497,567
Receivables.....	4,685,100	7,522,121
Prepaid assets.....	61,415	61,077
Capital assets, net of accumulated depreciation.....	5,646,331	5,488,201
Total assets.....	1,104,622,341	1,093,743,595
Liabilities:		
Accounts payable.....	121,604	165,081
Other.....	17,840	17,840
Total liabilities.....	139,444	182,921
Net Position Restricted for Pensions.....	\$ 1,104,482,897	1,093,560,674

Condensed Statement of Changes in Fiduciary Net Position

	<u>2015</u>	<u>2014</u>
Additions:		
Contributions:		
Member contributions.....	\$ 45,941,291	\$ 43,532,020
Employer contributions.....	99,820,481	93,400,946
Other contributions.....	<u>2,954,865</u>	<u>1,868,141</u>
Total contributions.....	<u>148,716,637</u>	<u>138,801,107</u>
Net investment income (loss):		
Total investment income (loss).....	13,362,645	80,449,082
Less, investment expenses.....	<u>(5,545,390)</u>	<u>(5,522,439)</u>
Net investment income (loss).....	<u>7,817,255</u>	<u>74,926,643</u>
Total additions.....	<u>156,533,892</u>	<u>213,727,750</u>
Deductions:		
Administration.....	2,824,804	2,996,390
Retirement benefits, refunds and transfers.....	142,321,498	130,639,608
Building operations and maintenance.....	302,773	381,899
Depreciation.....	<u>162,594</u>	<u>162,594</u>
Total deductions.....	<u>145,611,669</u>	<u>134,180,491</u>
Net increase (decrease) in fiduciary net position.....	10,922,223	79,547,259
Fiduciary net position at beginning of year.....	<u>1,093,560,674</u>	<u>1,014,013,415</u>
Fiduciary net position at end of year.....	<u>\$ 1,104,482,897</u>	<u>\$ 1,093,560,674</u>

Requests for Information

This financial report is designed to provide a general overview of the System's finances for all those with an interest in the System's finances. Questions concerning any of the information provided in this report or requests for additional financial information should be addressed to the System's Chief Administrative Officer, 25 Linnell Circle, Billerica, Massachusetts 01865.

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2015

Assets

Cash.....	\$ 48,386,377
Investments:	
PRIT funds.....	1,029,977,238
Pooled alternative investments.....	6,453,186
Pooled real estate funds.....	<u>9,412,694</u>
Total investments.....	<u>1,045,843,118</u>
Receivables:	
Member deductions.....	3,716,072
Members contributions.....	3,816
Member make-up payments and redeposits.....	169,690
Reimbursements from other systems.....	571,032
Other.....	<u>224,490</u>
Total receivables.....	<u>4,685,100</u>
Prepaid expenses.....	<u>61,415</u>
Capital assets, net of accumulated depreciation.....	<u>5,646,331</u>
Total assets.....	<u>1,104,622,341</u>

Liabilities

Accounts payable.....	121,604
Other.....	<u>17,840</u>
Total liabilities.....	<u>139,444</u>

Net Position Restricted for Pensions \$ 1,104,482,897

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED DECEMBER 31, 2015

Additions:	
Contributions:	
Member contributions.....	\$ 40,340,741
Member contributions - transfers from other systems.....	5,071,128
Retirement benefits - 3(8)c contributions from other systems.....	2,902,580
Members' makeup payments and redeposits.....	529,422
Workers compensation settlements.....	52,285
Employer - federal grant contributions.....	27,839
Employer contributions.....	<u>99,792,642</u>
 Total contributions.....	 <u>148,716,637</u>
Net investment income (loss):	
Investment income.....	13,362,645
 Less, investment expenses.....	 <u>(5,545,390)</u>
Net investment income (loss).....	<u>7,817,255</u>
 Total additions.....	 <u>156,533,892</u>
Deductions:	
Administration.....	2,824,804
Member contributions - transfers to other systems.....	3,739,939
Retirement benefits - 3(8)c payments to other systems.....	7,392,583
Retirement benefits and refunds.....	131,188,976
Building operations and maintenance.....	302,773
Depreciation.....	<u>162,594</u>
 Total deductions.....	 <u>145,611,669</u>
 Net increase (decrease) in fiduciary net position.....	 10,922,223
 Fiduciary net position at beginning of year.....	 <u>1,093,560,674</u>
 Fiduciary net position at end of year.....	 <u>\$ 1,104,482,897</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week. As of January 1, 2014, the System had 71 participating employers.

Instituted in 1937, the System is a member of the Massachusetts Contributory Retirement System and is governed by Chapter 32 of the Massachusetts General Laws. Membership in the Plan is mandatory immediately upon the commencement of employment for all permanent, full-time employees.

Massachusetts contributory retirement system benefits are, with certain exceptions, uniform from system to system. The System provides for retirement allowance benefits up to a maximum of 80% of a member's highest three-year average annual rate of regular compensation for those hired prior to April 2, 2012 and the highest five-year average for members hired after that date. Benefit payments are based upon a member's age, length of creditable service, level of compensation, and group classification.

Members become vested after ten years of creditable service. A superannuation retirement allowance may be received upon the completion of 20 years of service or upon reaching the age of 55 with 10 years of service. Normal retirement for most employees occurs at age 65 (except for certain hazardous duty and public safety positions, whose normal retirement is at age 55).

A retirement allowance consists of two parts: an annuity and a pension. A member's accumulated total deductions and the interest they generate constitute the annuity. The differential between the total retirement benefit and the annuity is the pension.

Active members contribute between 5% and 11% of their gross regular compensation. The percentage rate is keyed to the date upon which an employee's membership commences. These deductions are deposited in the Annuity Savings Fund and earn interest at a rate determined by the Public Employee Retirement Administration Commission's (PERAC) actuary. When a member's retirement becomes effective, his/her deductions and related interest are transferred to the Annuity Reserve Fund. Any cost-of-living adjustments granted between 1981 and 1997 and any increase in other benefits imposed by the Commonwealth of Massachusetts' state law during those years are borne by the Commonwealth and are deposited into the Pension Fund. Cost-of-living adjustments granted after 1997 must be approved by the System and all costs are borne by the System.

The pension portion of any retirement benefit is paid from the Pension Fund of the System. The governmental unit employing the member must annually appropriate and contribute the amount of current-year pension assessment.

Administrative expenses, which were previously appropriated from the governmental entities whose employees are members of the system, are now paid from investment income.

Members who become permanently and totally disabled for further duty may be eligible to receive a disability retirement allowance. The amount of benefits to be received in such cases is dependent on several factors, including whether or not the disability is work related, the member's age, years of creditable service, level of compensation, veterans' status and group classification.

Survivor benefits are extended to eligible beneficiaries of members whose death occurs prior to or following

retirement.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements of the Middlesex County Retirement System have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is the recognized standard-setting body for establishing governmental accounting and financial reporting principles.

MCRS is a special-purpose government engaged only in fiduciary activities. Accordingly, the financial statements are reported using the flow of economic resources measurement focus and use the accrual basis of accounting. Under this method, additions are recorded when earned and deductions are recorded when the liabilities are incurred.

Cash and Investments

Cash and cash equivalents are considered to be cash on hand, demand deposits and short-term investments with an original maturity of three months or less from the date of acquisition. Investments are carried at fair value. The fair values were determined by the closing price for those securities traded on national stock exchanges and at the average bid-and-asked quotation for those securities traded in the over-the-counter market. The fair value of private equities are based on management's valuation of estimates and assumptions from information and representations provided by the respective general partners, in the absence of readily ascertainable market values. Real estate assets are reported at fair value utilizing an income approach to valuation along with independent appraisals and estimates by management.

Accounts Receivable

Accounts receivable consist of member deductions, pension fund appropriations, and other miscellaneous reimbursements. These receivables are considered 100% collectible and therefore do not report an allowance for uncollectibles.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of fiduciary net position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents a consumption of fiduciary net position that applies to a future period(s) and so will not be recognized as an outflow of resources (deduction) until then. The MCRS did not have any items that qualify for reporting in this category.

In addition to liabilities, the statement of fiduciary net position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources*, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (addition) until that time. The MCRS did not have any items that qualify for reporting in this category.

NOTE 3 – PLAN ADMINISTRATION

The System is administered by a five-person Board of Retirement consisting of a first member, who shall serve as Chairman/Treasurer, who shall be appointed by the other four members, a second member elected by the Advisory Council consisting of representatives from the member units, a third and fourth member who shall be

elected by the members in or retired from the service of such system, and a fifth member who shall be chosen by the other four members.

Chairman	Thomas F. Gibson	Term Expires:	12/31/2020
Advisory Council Member	Brian P. Curtin	Term Expires:	12/31/2019
Elected Member	John Brown	Term Expires:	12/31/2017
Elected Member	Edgar W. McLean, Jr.	Term Expires:	12/31/2016
Appointed Member	Robert W. Healy	Term Expires:	12/17/2020

Board members are required to meet at least once a month. The Board must keep a record of all of its proceedings. The Board must annually submit to the appropriate authority an estimate of the expenses of administration and cost of operation of the System. The Board must annually file a financial statement of condition for the System with the Executive Director of PERAC.

The investment of the System's funds is the responsibility of the Board. All retirement allowances must be approved by the Retirement Board. The PERAC Actuary performs verification prior to payment, unless the System has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the System must be approved by a majority vote of the Board. Payments shall be made only upon vouchers signed by three persons designated by the Board.

The following retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts as follows:

Treasurer-Custodian:	)	\$10,000,000 Fiduciary
Ex-Officio Member:	)	RLI Insurance Company
Elected Members:)	
Appointed Members:	)	\$1,000,000 Fidelity
Staff Employees:	)	National Union Fire Insurance

NOTE 4 – OFFICE BUILDING

The MCRS owns an office building that was purchased as an investment and for the administrative offices of the System. The building is a two story, 1986-built office building consisting of 62,307 square feet of net rentable area. The property is situated on a 4.23 acre site in Billerica, Middlesex County, Massachusetts

NOTE 5 – CASH AND INVESTMENTSCustodial Credit Risk - Deposits

At December 31, 2015, the carrying amount of the System's deposits totaled \$6,653,851 and the bank balance totaled \$8,169,271, all of which was covered by Federal Depository Insurance.

Investments

The System's investments are as follows:

<u>Other Investments</u>	
PRIT Pooled Funds.....	\$ 1,029,977,238
Money Market Mutual Funds.....	41,732,526
Pooled Alternative Investments.....	6,453,186
Pooled Real Estate Funds.....	<u>9,412,694</u>
Total Investments.....	<u>\$ 1,087,575,644</u>

Approximately 95% of the Retirement System's investments are in Pension Reserve Investment Trust (PRIT). This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board. The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The Administration does not have the ability to control any of the investment decisions relative to its funds in PRIT.

Approximately 1.5% of the System's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

The Administration's annual money-weighted rate of return on pension plan investments was 0.61%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

NOTE 6 – CAPITAL ASSETS

Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

<u>Capital Asset Type</u>	<u>Estimated Useful Life (in years)</u>
Building.....	40
Building improvements.....	40
Ford Pick-up truck with plow.....	5

Capital asset activity for the year ended December 31, 2015, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
Construction in progress.....	267,270	320,724	-	587,994
Total capital assets not being depreciated.....	939,927	320,724	-	1,260,651
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,086,623	-	-	1,086,623
Ford Pick-up truck with plow.....	19,603	-	-	19,603
Total capital assets being depreciated.....	6,523,362	-	-	6,523,362
<u>Less accumulated depreciation for:</u>				
Buildings.....	(1,629,498)	(135,428)	-	(1,764,926)
Building improvements.....	(325,987)	(27,166)	-	(353,153)
Ford Pick-up truck with plow.....	(19,603)	-	-	(19,603)
Total accumulated depreciation.....	(1,975,088)	(162,594)	-	(2,137,682)
Total capital assets being depreciated, net.....	4,548,274	(162,594)	-	4,385,680
Total capital assets, net.....	\$ 5,488,201	\$ 158,130	\$ -	\$ 5,646,331

NOTE 7 – MEMBERSHIP

The following table represents the System's membership at December 31, 2015:

Active members.....	10,306
Inactive members.....	1,748
Disabled members.....	429
Retirees and beneficiaries currently receiving benefits.....	4,859
Total.....	17,342

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2015 were as follows:

Total pension liability.....	\$ 2,394,501,842
The pension plan's fiduciary net position.....	<u>1,104,482,897</u>
The net pension liability.....	\$ <u>1,290,018,945</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	46.13%

The total pension liability was determined by an actuarial valuation as of January 1, 2014, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2015:

Valuation date.....	January 1, 2014
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.5% for fiscal 2016 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, 2014, 5 years remaining for 2002 ERI liability, 6 years remaining for 2003 ERI liability, 8 years remaining for 2010 ERI liability, and 21 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.
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 (previously, 4.75% for group 1 and 5.25% for group 4).
Cost of living adjustments.....	3.0% of the first \$14,000 of retirement income.
Rates of retirement.....	Varies based upon age for general employees, police and fire employees.
Rates of disability.....	For general employees, it was assumed that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).
Mortality Rates:	
Pre-Retirement.....	The RP-2000 Employee Mortality Table projected 22 years with Scale AA.
Post-Retirement.....	The RP-2000 Employee Mortality Table projected 17 years with Scale AA.
Disabled Retiree.....	The RP-2000 Healthy Annuitant Mortality Table set forward three years projected 17 years with Scale AA.
Investment rate of return/Discount rate.....	7.875%, net of pension plan investment expense, including inflation previously 8.0%

Investment policy: The pension plan's policy in regard to the allocation of invested assets is established by PRIT. Plan assets are managed on a total return basis with a long-term objective of achieving a fully funded status for the benefits provided through the pension plan.

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 January 1, 2014 are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return	Long-Term Expected Asset Allocation
Domestic equity.....	6.49%	19.60%
International developed markets equity.....	7.16%	15.60%
International emerging markets equity.....	9.46%	6.50%
Core fixed income.....	1.68%	15.30%
High-yield fixed income.....	4.76%	8.30%
Real estate.....	4.37%	9.90%
Commodities.....	4.13%	3.90%
Short-term government money market.....	1.11%	0.00%
Hedge fund, GTAA, Risk parity.....	3.60%	9.80%
Private equity.....	11.04%	11.10%
		100.00%

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 contributions will be made at rates equal to the actuarially determined contribution rate. 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 position liability to changes in the discount rate. The following presents the net position liability, calculated using the discount rate of 7.875%, as well as what the net position 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, 2015.....	\$ 1,549,069,449	\$ 1,290,018,945	\$ 1,069,419,459

Contributions: Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The pension fund appropriations are allocated amongst employers based on the actuarial valuation.

NOTE 9 – TOWN OF ACTON SETTLEMENT

In March of 2011 the Town of Acton and the MCRS reached a settlement regarding a civil suit filed by the Town of Acton. The Town of Acton sought relief relating to increased assessments due to investment losses incurred by the System. The MCRS agreed to credit against (i.e. to reduce) Acton's annual assessment by a total credit of \$300,000, which is to be credited, at a minimum, in installments of \$37,500 per year for a period of eight years or in larger installments until the total credit of \$300,000 is paid in full to Acton, whichever is earlier. Without limiting the foregoing, the MCRS intends to fund the credit through the System's operating budget and will not increase assessments to members of the System (including Acton) to fund the credit. The Parties agree that Acton shall receive the credit for each year that Acton is a member of the MCRS so that if Acton ceases to be a member of the MCRS, any remaining amount of the credit then outstanding will be forfeited. The Parties further agree that the MCRS may, at its discretion, credit all or a part of this obligation in one year. If the MCRS credits more than \$37,500 in any given year, the remaining years' obligations will be ratably and proportionally reduced. As of December 31, 2015, the Town of Acton has been credited \$225,000.

NOTE 10 – DISPUTE WITH THE COMMONWEALTH AND STATE EMPLOYEES RETIREMENT SYSTEM

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County be transferred to the Commonwealth. Therefore the MCRS was required to transfer the Annuity Savings Fund Balances of these transferred County employees to the State Employees Retirement System (SERS). This transfer, totaling approximately \$18 million, was made during calendar year 1998.

In December of 1999, the State Legislature enacted Massachusetts General Law, Chapter 34B (Abolition of County Government). This legislation, among other things, defines the components of determining the overall surplus or deficit of an abolished County upon transfer to the Commonwealth and how regional retirement systems will be affected. Sections 8 and 18 addressed how the abolished County's unfunded liabilities in regional retirement systems will be paid for. The MCRS believes, as a result of the abolishment of Middlesex County, that the Commonwealth of Massachusetts owed them \$9,501,680 for the Unfunded Liability for retirees of the former Middlesex County.

The Commonwealth and SERS did not agree with the assertion that the MCRS was owed \$9,501,680. As a result, the MCRS acted to stop 3(8)(c) reimbursements to the State Employees Retirement System and correspondingly the State System began to intercept all COLA reimbursements which were due the MCRS. In 2012 the MCRS reinstated payments for 3(8)(c) reimbursements to the SERS. The SERS and MCRS are currently working to determine the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld. It is expected that all amounts except for the \$9.5 million will be resolved in 2016. The net amount of these transactions is not considered significant and has not been reported in these financial statements.

NOTE 11 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

The following GASB pronouncements will be implemented in the future:

- The GASB issued Statement #72, *Fair Value Measurement and Application*, which is required to be implemented in 2016.
- The GASB issued Statement #76, *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments*, which is required to be implemented in 2016.

- The GASB issued Statement #78, *Pensions Provided through Certain Multiple-Employer Defined Benefit Pension Plans*, which is required to be implemented in 2016.
- The GASB issued Statement #79, *Certain External Investment Pools and Pool Participants*, which is required to be implemented in 2016 with certain provisions to be implemented in 2016.
- The GASB issued Statement #82, *Pension Issues – an amendment of GASB Statements #67, #68, and #73*, which is required to be implemented in 2017.

Management is currently assessing the impact the implementation of these pronouncements will have on the financial statements.

NOTE 12 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through August 22, 2016, which is the date the financial statements were available to be issued.

Required Supplementary Information

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
AND RELATED RATIOS**

	2014	2015
Total pension liability:		
Service cost.....	\$ 52,132,389	\$ 54,217,685
Interest.....	172,094,226	179,703,272
Changes in benefit terms.....	-	-
Differences between expected and actual experience.....	-	-
Changes in assumptions.....	-	-
Benefit payments, including refunds of employee contributions.....	<u>(125,082,678)</u>	<u>(134,295,504)</u>
Net change in total pension liability.....	99,143,937	99,625,453
Total pension liability, beginning.....	<u>2,195,732,452</u>	<u>2,294,876,389</u>
Total pension liability, ending (a)	<u>\$ 2,294,876,389</u>	<u>\$ 2,394,501,842</u>
Plan fiduciary net position:		
Member contributions.....	\$ 39,806,980	40,870,163
Employer contributions.....	93,400,946	99,820,481
Net investment income (loss).....	74,962,895	7,817,255
Retirement benefits and refunds.....	(125,082,678)	(134,295,504)
Administrative expenses.....	<u>(3,540,884)</u>	<u>(3,290,172)</u>
Net increase (decrease) in fiduciary net position.....	79,547,259	10,922,223
Fiduciary net position at beginning of year.....	<u>1,014,013,415</u>	<u>1,093,560,674</u>
Fiduciary net position at end of year (b)	<u>\$ 1,093,560,674</u>	<u>\$ 1,104,482,897</u>
Net pension liability - ending (a) - (b)	<u>\$ 1,201,315,715</u>	<u>\$ 1,290,018,945</u>
Plan fiduciary net position as a percentage of the total pension liability.....	47.65%	46.13%
Covered-employee payroll (*).....	\$ 415,752,810	432,382,921
Net pension liability as a percentage of covered-employee payroll.....	288.95%	298.35%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those years for which information is available.

See notes to required supplementary information.

SCHEDULE OF CONTRIBUTIONS

	2014	2015
Actuarially determined contribution..... \$	92,826,743	\$ 98,792,642
Contributions in relation to the actuarially determined contribution.....	93,400,946	99,820,481
Contribution deficiency (excess)..... \$	(574,203)	\$ (1,027,839)
Covered-employee payroll (*)..... \$	415,752,810	\$ 432,382,921
Contributions as a percentage of covered- employee payroll.....	22.47%	23.09%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those
years for which information is available.

See notes to required supplementary information.

SCHEDULE OF INVESTMENT RETURN

	2014	2015
Annual money-weighted rate of return, net of investment expense.....	7.54%	0.61%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those
years for which information is available.

The annual money-weighted rate of return has been calculated by
the Pension Reserves Investment Management Board (PRIM).

See notes to required supplementary information.

NOTE A – CHANGES IN THE NET PENSION LIABILITY AND RELATED RATIOS

The Schedule of Changes in the Net Pension Liability and Related Ratios includes the detailed changes in the system's total pension liability, changes in the system's net position, and the ending net pension liability. It also demonstrates the plan's net position as a percentage of the total pension liability and the net pension liability as a percentage of covered payroll.

Since the system performs an actuarial valuation bi-annually, there are no reported amounts for the changes in benefit terms, differences between expected and actual experience and changes in assumptions as of December 31, 2015.

NOTE B – CONTRIBUTIONS

Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The total appropriations are payable on July 1 and January 1. Employers may choose to pay the entire appropriation in July at a discounted rate. Accordingly, actual employer contributions may be less than the "total appropriation". The pension fund appropriations are allocated amongst employers based on covered payroll. In addition, an employer may contribute more than the amount required.

NOTE C – MONEY WEIGHTED RATE OF RETURN

The money weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. A money weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested. Inputs to the money weighted rate of return calculation are determined monthly.

Audit of Specific Elements, Accounts and Items of Financial Statements



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

We have audited the accompanying schedule of employer allocations of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2015, and the related notes. We have also audited the total for all entities of the rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total covered payroll, total pension expense and contributions included in the accompanying schedule of pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2015, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified row totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and total for all rows titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total covered payroll, total pension expense and contributions for the total of all participating entities for the Middlesex County Retirement System as of and for the year ended December 31, 2015, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the Middlesex County Retirement System as of and for the year ended December 31, 2015, and our report thereon, dated August 22, 2016, expressed an unmodified opinion on those financial statements.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System management, the Middlesex County Retirement System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.



August 29, 2016

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2015

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	44,369,446	3.439441%
Town of Ashby.....	1,611,292	0.124905%
Town of Ashland.....	26,910,611	2.086063%
Town of Ayer.....	17,086,573	1.324521%
Town of Bedford.....	47,296,776	3.666363%
Town of Billerica.....	127,076,615	9.850756%
Town of Boxborough.....	7,963,070	0.617283%
Town of Burlington.....	104,556,462	8.105033%
Town of Carlisle.....	8,912,755	0.690901%
Town of Chelmsford.....	93,051,442	7.213184%
Town of Dracut.....	52,368,527	4.059516%
Town of Dunstable.....	2,389,144	0.185202%
Town of Groton.....	20,586,198	1.595806%
Town of Holliston.....	23,403,449	1.814194%
Town of Hopkinton.....	19,499,185	1.511543%
Town of Hudson.....	56,963,462	4.415707%
Town of Lincoln.....	23,666,611	1.834594%
Town of Littleton.....	21,397,309	1.658682%
Town of North Reading.....	44,145,145	3.422054%
Town of Pepperell.....	12,706,598	0.964993%
Town of Sherborn.....	10,262,053	0.795496%
Town of Shirley.....	9,134,041	0.708055%
Town of Stow.....	9,234,186	0.715818%
Town of Sudbury.....	51,874,232	4.021199%
Town of Tewksbury.....	85,301,248	6.612403%
Town of Townsend.....	7,475,618	0.579497%
Town of Tyngsborough.....	17,982,560	1.393976%
Town of Wayland.....	53,154,605	4.120452%
Town of Westford.....	47,358,134	3.671119%
Town of Weston.....	58,678,679	4.548668%
Town of Wilmington.....	74,403,164	5.767602%
Acton-Boxborough Regional School District.....	23,515,180	1.822855%
Acton Water Supply.....	2,784,648	0.215861%
Bedford Housing Authority.....	263,833	0.020452%
Billerica Housing Authority.....	1,068,744	0.082847%
Chelmsford Housing Authority.....	1,138,990	0.088293%
Chelmsford Water District.....	1,402,613	0.108728%
Dracut Housing Authority.....	1,785,743	0.138428%
Dracut Water Supply.....	2,428,037	0.188217%
East Chelmsford Water District.....	286,759	0.022229%
East Middlesex Mosquito Control.....	496,144	0.038460%
Greater Lowell Regional Vocational Technical School District.....	14,784,348	1.146057%
Groton-Dunstable Regional School District.....	8,509,375	0.659832%
Hudson Housing Authority.....	1,399,262	0.108468%
Lincoln-Sudbury Regional School District.....	7,913,632	0.613466%
Nashoba Valley Technical High School District.....	3,156,315	0.244672%
North Chelmsford Water District.....	748,681	0.058036%
North Middlesex Regional School District.....	10,991,588	0.852049%
Shawsheen Valley Regional Vocational School.....	7,364,846	0.570910%
South Middlesex Regional Vocational Technical School.....	6,481,194	0.502411%
Sudbury Water District.....	1,446,469	0.112128%
Tewksbury Housing Authority.....	1,248,093	0.096750%
Wayland Housing Authority.....	447,164	0.034663%
Hopkinton Housing Authority.....	442,908	0.034333%
Sudbury Housing Authority.....	266,258	0.020640%
Wilmington Housing Authority.....	271,567	0.021051%
Acton Housing Authority.....	827,882	0.064176%
Burlington Housing Authority.....	119,574	0.009269%
Ayer Housing Authority.....	441,841	0.034251%
Holliston Housing Authority.....	214,474	0.016626%
Littleton Housing Authority.....	367,115	0.028458%
Westford Housing Authority.....	427,017	0.033102%
Shirley Water District.....	358,461	0.027787%
Tyngsborough Housing Authority.....	399,306	0.030953%
Pepperell Housing Authority.....	100,348	0.007779%
Groton Housing Authority.....	12,029	0.000932%
Tyngsborough Water District.....	372,014	0.028838%
North Reading Housing Authority.....	84,100	0.006519%
West Groton Water.....	24,760	0.001919%
Ayer-Shirley Regional School District.....	4,808,243	0.372727%
Total.....	\$ 1,290,018,945	100.000%

See notes to schedule of employer allocations and schedule of pension amounts by employer.

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability.....	\$ -	\$ -	\$ -	\$ 41,050,336
Ending net pension liability.....	\$ -	\$ -	\$ -	\$ 44,369,446
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	2,262,498
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	213,858
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 2,476,356
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	142,929
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 142,929
Pension Expense				
Proportionate share of plan pension expense.....	\$ 311,767	\$ -	\$ -	\$ 4,350,475
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	17,735
Total Employer Pension Expense.....	\$ 311,767	\$ -	\$ -	\$ 4,368,210
Contributions				
Statutory required contribution.....	\$ 311,767	\$ -	\$ -	\$ 3,243,883
Contribution in relation to statutory required contribution.....	(311,767)	-	-	(3,243,883)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	21.27%	0.00%	0.00%	24.86%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ -	\$ -	\$ -	\$ 592,081
June 30, 2018.....	-	-	-	592,081
June 30, 2019.....	-	-	-	592,082
June 30, 2020.....	-	-	-	557,183
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 2,333,427
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ -	\$ -	\$ -	\$ 53,279,358
Current discount rate (7.875%).....	\$ -	\$ -	\$ -	\$ 44,369,446
1% increase (8.875%).....	\$ -	\$ -	\$ -	\$ 36,782,072
Covered Payroll.....	\$ 1,465,931	\$ -	\$ -	\$ 13,048,335
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability.....	\$ 1,427,805	\$ 24,556,017	\$ 15,773,883	\$ 43,939,870
Ending net pension liability.....	\$ 1,611,292	\$ 26,910,611	\$ 17,086,573	\$ 47,296,776
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	82,164	1,372,234	871,284	2,411,771
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	89,441	590,599	130,087	83,497
Total Deferred Outflows of Resources.....	\$ <u>171,605</u>	\$ <u>1,962,833</u>	\$ <u>1,001,371</u>	\$ <u>2,495,268</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	133,462
Total Deferred Inflows of Resources.....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>133,462</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 157,990	\$ 2,638,616	\$ 1,675,359	\$ 4,637,503
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	22,361	147,650	32,522	(12,492)
Total Employer Pension Expense.....	\$ <u>180,351</u>	\$ <u>2,786,266</u>	\$ <u>1,707,881</u>	\$ <u>4,625,011</u>
Contributions				
Statutory required contribution.....	\$ 163,640	\$ 2,283,740	\$ 1,343,292	\$ 3,481,523
Contribution in relation to statutory required contribution.....	(163,640)	(2,311,579)	(1,343,292)	(3,481,523)
Contribution deficiency/(excess).....	\$ -	\$ (27,839)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	17.67%	19.56%	24.92%	20.65%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 43,219	\$ 495,998	\$ 253,701	\$ 599,747
June 30, 2018.....	43,219	495,998	253,701	599,747
June 30, 2019.....	43,219	495,998	253,701	599,747
June 30, 2020.....	41,948	474,839	240,268	562,565
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ <u>171,605</u>	\$ <u>1,962,833</u>	\$ <u>1,001,371</u>	\$ <u>2,361,806</u>
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 1,934,865	\$ 32,314,565	\$ 20,517,750	\$ 56,794,509
Current discount rate (7.875%).....	\$ 1,611,292	\$ 26,910,611	\$ 17,086,573	\$ 47,296,776
1% increase (8.875%).....	\$ 1,335,758	\$ 22,308,764	\$ 14,164,685	\$ 39,208,799
Covered Payroll.....	\$ 926,336	\$ 11,676,182	\$ 5,391,242	\$ 16,858,665
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability.....	\$ 119,887,544	\$ 7,339,622	\$ 98,053,205	\$ 7,984,515
Ending net pension liability.....	\$ 127,076,615	\$ 7,963,070	\$ 104,556,462	\$ 8,912,755
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	6,479,929	406,055	5,331,574	454,482
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	73,033	-	318,346
Total Deferred Outflows of Resources.....	\$ 6,479,929	\$ 479,088	\$ 5,331,574	\$ 772,828
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,713,152	-	683,016	-
Total Deferred Inflows of Resources.....	\$ 1,713,152	\$ -	\$ 683,016	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 12,460,010	\$ 780,788	\$ 10,251,881	\$ 873,906
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(428,288)	18,259	(170,754)	79,586
Total Employer Pension Expense.....	\$ 12,031,722	\$ 799,047	\$ 10,081,127	\$ 953,492
Contributions				
Statutory required contribution.....	\$ 9,204,554	\$ 629,903	\$ 7,895,297	\$ 771,117
Contribution in relation to statutory required contribution.....	(9,204,554)	(629,903)	(7,895,297)	(771,117)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	29.33%	21.77%	25.99%	16.32%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 1,216,672	\$ 121,338	\$ 1,182,691	\$ 194,958
June 30, 2018.....	1,216,672	121,338	1,182,691	194,958
June 30, 2019.....	1,216,672	121,338	1,182,691	194,958
June 30, 2020.....	1,116,761	115,074	1,100,485	187,954
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 4,766,777	\$ 479,088	\$ 4,648,558	\$ 772,828
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 152,595,052	\$ 9,562,142	\$ 125,552,590	\$ 10,702,536
Current discount rate (7.875%).....	\$ 127,076,615	\$ 7,963,070	\$ 104,556,462	\$ 8,912,755
1% increase (8.875%).....	\$ 105,345,902	\$ 6,601,345	\$ 86,676,800	\$ 7,388,630
Covered Payroll.....	\$ 31,382,222	\$ 2,893,796	\$ 30,378,636	\$ 4,723,787
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability.....	\$ 88,099,468	\$ 48,701,871	\$ 2,190,299	\$ 19,495,870
Ending net pension liability.....	\$ 93,051,442	\$ 52,368,527	\$ 2,389,144	\$ 20,586,198
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	4,744,907	2,670,392	121,828	1,049,738
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	52,409	52,403	119,901
Total Deferred Outflows of Resources.....	\$ <u>4,744,907</u>	\$ <u>2,722,801</u>	\$ <u>174,231</u>	\$ <u>1,169,639</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,218,542	55,401	-	259,283
Total Deferred Inflows of Resources.....	\$ <u>1,218,542</u>	\$ <u>55,401</u>	\$ <u>-</u>	\$ <u>259,283</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 9,123,802	\$ 5,134,795	\$ 234,259	\$ 2,018,501
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(304,635)	(748)	13,101	(34,846)
Total Employer Pension Expense.....	\$ <u>8,819,167</u>	\$ <u>5,134,047</u>	\$ <u>247,360</u>	\$ <u>1,983,655</u>
Contributions				
Statutory required contribution.....	\$ 7,096,040	\$ 3,970,321	\$ 215,351	\$ 1,737,842
Contribution in relation to statutory required contribution.....	(7,096,040)	(3,970,321)	(215,351)	(1,737,842)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	29.49%	27.23%	19.51%	25.22%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 899,881	\$ 677,143	\$ 44,028	\$ 231,635
June 30, 2018.....	899,881	677,143	44,028	231,635
June 30, 2019.....	899,881	677,143	44,028	231,635
June 30, 2020.....	826,722	635,971	42,147	215,451
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ <u>3,526,365</u>	\$ <u>2,667,400</u>	\$ <u>174,231</u>	\$ <u>910,356</u>
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 111,737,230	\$ 62,884,722	\$ 2,868,908	\$ 24,720,143
Current discount rate (7.875%).....	\$ 93,051,442	\$ 52,368,527	\$ 2,389,144	\$ 20,586,198
1% increase (8.875%).....	\$ 77,139,193	\$ 43,413,254	\$ 1,980,586	\$ 17,065,860
Covered Payroll.....	\$ 24,062,042	\$ 14,583,214	\$ 1,103,607	\$ 6,891,765
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability.....	\$ 21,225,487	\$ 16,828,857	\$ 52,755,296	\$ 21,739,395
Ending net pension liability.....	\$ 23,403,449	\$ 19,499,185	\$ 56,963,462	\$ 23,666,611
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	1,193,396	994,309	2,904,698	1,206,815
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	498,420	1,239,748	234,831	239,087
Total Deferred Outflows of Resources.....	\$ 1,691,816	\$ 2,234,057	\$ 3,139,529	\$ 1,445,902
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	18,138
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 18,138
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,294,735	\$ 1,911,919	\$ 5,585,333	\$ 2,320,538
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	124,605	309,936	58,708	55,238
Total Employer Pension Expense.....	\$ 2,419,340	\$ 2,221,855	\$ 5,644,041	\$ 2,375,776
Contributions				
Statutory required contribution.....	\$ 1,861,516	\$ 1,728,744	\$ 4,397,249	\$ 1,802,909
Contribution in relation to statutory required contribution.....	(1,861,516)	(1,728,744)	(4,397,249)	(1,802,909)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	18.27%	13.80%	20.93%	18.79%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 427,554	\$ 562,346	\$ 796,079	\$ 361,593
June 30, 2018.....	427,554	562,346	796,079	361,593
June 30, 2019.....	427,554	562,346	796,079	361,593
June 30, 2020.....	409,154	547,019	751,292	342,985
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 1,691,816	\$ 2,234,057	\$ 3,139,529	\$ 1,427,764
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 28,103,125	\$ 23,414,851	\$ 68,402,368	\$ 28,419,135
Current discount rate (7.875%).....	\$ 23,403,449	\$ 19,499,185	\$ 56,963,462	\$ 23,666,611
1% increase (8.875%).....	\$ 19,401,344	\$ 16,164,735	\$ 47,222,430	\$ 19,619,505
Covered Payroll.....	\$ 10,190,662	\$ 12,526,442	\$ 21,010,326	\$ 9,595,007
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability.....	\$ 19,021,595	\$ 41,397,005	\$ 11,580,175	\$ 9,464,261
Ending net pension liability.....	\$ 21,397,309	\$ 44,145,145	\$ 12,706,598	\$ 10,262,053
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	1,091,098	2,251,062	647,939	523,285
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	810,512	-	224,672	97,295
Total Deferred Outflows of Resources.....	\$ 1,901,610	\$ 2,251,062	\$ 872,611	\$ 620,580
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	326,609	-	-
Total Deferred Inflows of Resources.....	\$ -	\$ 326,609	\$ -	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,098,031	\$ 4,328,482	\$ 1,245,897	\$ 1,006,205
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	202,629	(81,653)	56,167	24,323
Total Employer Pension Expense.....	\$ 2,300,660	\$ 4,246,829	\$ 1,302,064	\$ 1,030,528
Contributions				
Statutory required contribution.....	\$ 1,762,316	\$ 3,283,343	\$ 1,009,146	\$ 821,360
Contribution in relation to statutory required contribution.....	(1,762,316)	(3,283,343)	(1,009,146)	(821,360)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	16.34%	26.09%	22.63%	20.86%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 479,609	\$ 489,790	\$ 220,649	\$ 157,161
June 30, 2018.....	479,609	489,790	220,649	157,161
June 30, 2019.....	479,609	489,790	220,649	157,161
June 30, 2020.....	462,783	455,083	210,664	149,097
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 1,901,610	\$ 1,924,453	\$ 872,611	\$ 620,580
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 25,694,136	\$ 53,009,993	\$ 15,258,226	\$ 12,322,786
Current discount rate (7.875%).....	\$ 21,397,309	\$ 44,145,145	\$ 12,706,598	\$ 10,262,053
1% increase (8.875%).....	\$ 17,738,268	\$ 36,596,111	\$ 10,533,707	\$ 8,507,189
Covered Payroll.....	\$ 10,782,598	\$ 12,585,689	\$ 4,458,982	\$ 3,936,908
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability.....	\$ 8,549,600	\$ 8,519,238	\$ 48,635,848	\$ 81,064,434
Ending net pension liability.....	\$ 9,134,041	\$ 9,234,186	\$ 51,874,232	\$ 85,301,248
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	465,766	470,872	2,645,186	4,349,707
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,714	63,781	-	5,135
Total Deferred Outflows of Resources.....	\$ 470,480	\$ 534,653	\$ 2,645,186	\$ 4,354,842
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	34,781	8,114	494,383	1,298,478
Total Deferred Inflows of Resources.....	\$ 34,781	\$ 8,114	\$ 494,383	\$ 1,298,478
Pension Expense				
Proportionate share of plan pension expense.....	\$ 895,604	\$ 905,422	\$ 5,086,328	\$ 8,363,887
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(7,517)	13,917	(123,596)	(323,336)
Total Employer Pension Expense.....	\$ 888,087	\$ 919,339	\$ 4,962,732	\$ 8,040,551
Contributions				
Statutory required contribution.....	\$ 710,468	\$ 702,159	\$ 3,710,907	\$ 6,586,336
Contribution in relation to statutory required contribution.....	(710,468)	(702,159)	(3,710,907)	(6,586,336)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	35.21%	21.95%	24.96%	33.44%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 110,720	\$ 133,450	\$ 547,897	\$ 780,857
June 30, 2018.....	110,720	133,450	547,897	780,857
June 30, 2019.....	110,720	133,450	547,897	780,857
June 30, 2020.....	103,539	126,189	507,112	713,793
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 435,699	\$ 526,539	\$ 2,150,803	\$ 3,056,364
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 10,968,264	\$ 11,088,518	\$ 62,291,165	\$ 102,430,715
Current discount rate (7.875%).....	\$ 9,134,041	\$ 9,234,186	\$ 51,874,232	\$ 85,301,248
1% increase (8.875%).....	\$ 7,572,078	\$ 7,655,097	\$ 43,003,485	\$ 70,714,324
Covered Payroll.....	\$ 2,017,558	\$ 3,198,487	\$ 14,865,858	\$ 19,696,238
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability.....	\$ 6,742,808	\$ 16,343,894	\$ 49,341,309	\$ 42,997,563
Ending net pension liability.....	\$ 7,475,618	\$ 17,982,560	\$ 53,154,605	\$ 47,358,134
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	381,199	916,972	2,710,476	2,414,900
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	233,146	360,577	126,234	1,152,928
Total Deferred Outflows of Resources.....	\$ 614,345	\$ 1,277,549	\$ 2,836,710	\$ 3,567,828
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	102,577	-
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ 102,577	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 732,993	\$ 1,763,210	\$ 5,211,871	\$ 4,643,520
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	58,286	90,144	5,915	288,232
Total Employer Pension Expense.....	\$ 791,279	\$ 1,853,354	\$ 5,217,786	\$ 4,931,752
Contributions				
Statutory required contribution.....	\$ 650,040	\$ 1,437,048	\$ 3,971,988	\$ 3,993,806
Contribution in relation to statutory required contribution.....	(650,040)	(1,437,048)	(3,971,988)	(3,993,806)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	21.68%	19.31%	21.95%	17.62%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 155,055	\$ 322,921	\$ 693,982	\$ 901,265
June 30, 2018.....	155,055	322,921	693,982	901,265
June 30, 2019.....	155,055	322,921	693,982	901,265
June 30, 2020.....	149,180	308,786	652,187	864,033
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 614,345	\$ 1,277,549	\$ 2,734,133	\$ 3,567,828
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 8,976,811	\$ 21,593,656	\$ 63,828,663	\$ 56,868,183
Current discount rate (7.875%).....	\$ 7,475,618	\$ 17,982,560	\$ 53,154,605	\$ 47,358,134
1% increase (8.875%).....	\$ 6,197,254	\$ 14,907,451	\$ 44,064,915	\$ 39,259,661
Covered Payroll.....	\$ 2,998,738	\$ 7,440,290	\$ 18,096,912	\$ 22,663,136
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability.....	\$ 54,939,016	\$ 69,798,925	\$ 21,781,913	\$ 2,562,079
Ending net pension liability.....	\$ 58,678,679	\$ 74,403,164	\$ 23,515,180	\$ 2,784,648
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	2,992,161	3,793,988	1,199,093	141,996
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	210,769	24,790
Total Deferred Outflows of Resources.....	\$ <u>2,992,161</u>	\$ <u>3,793,988</u>	\$ <u>1,409,862</u>	\$ <u>166,786</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	440,189	725,683	-	39,208
Total Deferred Inflows of Resources.....	\$ <u>440,189</u>	\$ <u>725,683</u>	\$ <u>-</u>	\$ <u>39,208</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 5,753,513	\$ 7,295,316	\$ 2,305,690	\$ 273,038
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(110,047)	(181,421)	52,693	(3,604)
Total Employer Pension Expense.....	\$ <u>5,643,466</u>	\$ <u>7,113,895</u>	\$ <u>2,358,383</u>	\$ <u>269,434</u>
Contributions				
Statutory required contribution.....	\$ 4,270,242	\$ 5,342,251	\$ 1,961,424	\$ 165,791
Contribution in relation to statutory required contribution.....	(4,270,242)	(5,342,251)	(1,961,424)	(165,791)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	22.05%	25.32%	15.21%	16.35%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 649,527	\$ 781,700	\$ 357,088	\$ 32,442
June 30, 2018.....	649,527	781,700	357,088	32,442
June 30, 2019.....	649,527	781,700	357,088	32,442
June 30, 2020.....	603,391	723,205	338,598	30,252
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ <u>2,551,972</u>	\$ <u>3,068,305</u>	\$ <u>1,409,862</u>	\$ <u>127,578</u>
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 70,462,026	\$ 89,344,161	\$ 28,237,290	\$ 3,343,837
Current discount rate (7.875%).....	\$ 58,678,679	\$ 74,403,164	\$ 23,515,180	\$ 2,784,648
1% increase (8.875%).....	\$ 48,644,341	\$ 61,679,858	\$ 19,493,966	\$ 2,308,460
Covered Payroll.....	\$ 19,366,732	\$ 21,102,836	\$ 12,897,778	\$ 1,013,745
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability.....	\$ 243,648	\$ 1,012,365	\$ 1,002,070	\$ 2,106,325
Ending net pension liability.....	\$ 263,833	\$ 1,068,744	\$ 1,138,990	\$ 1,402,613
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	13,454	54,498	58,080	71,522
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	6,570	438	51,417	862,284
Total Deferred Outflows of Resources.....	\$ <u>20,024</u>	\$ <u>54,936</u>	\$ <u>109,497</u>	\$ <u>933,806</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	13,642	-	637,965
Total Deferred Inflows of Resources.....	\$ <u>-</u>	\$ <u>13,642</u>	\$ <u>-</u>	\$ <u>637,965</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 25,870	\$ 104,792	\$ 111,680	\$ 137,527
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,643	(3,301)	12,854	56,080
Total Employer Pension Expense.....	\$ <u>27,513</u>	\$ <u>101,491</u>	\$ <u>124,534</u>	\$ <u>193,607</u>
Contributions				
Statutory required contribution.....	\$ 26,527	\$ 82,988	\$ 93,720	\$ 186,049
Contribution in relation to statutory required contribution.....	<u>(26,527)</u>	<u>(82,988)</u>	<u>(93,720)</u>	<u>(1,186,049)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>(1,000,000)</u>
Contributions as a percentage of covered payroll.....	19.69%	26.87%	6.84%	15.22%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 5,058	\$ 10,533	\$ 27,598	\$ 74,236
June 30, 2018.....	5,058	10,533	27,598	74,236
June 30, 2019.....	5,058	10,533	27,598	74,236
June 30, 2020.....	4,850	9,695	26,703	73,133
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ <u>20,024</u>	\$ <u>41,294</u>	\$ <u>109,497</u>	\$ <u>295,841</u>
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 316,816	\$ 1,283,358	\$ 1,367,720	\$ 1,684,272
Current discount rate (7.875%).....	\$ 263,833	\$ 1,068,744	\$ 1,138,990	\$ 1,402,613
1% increase (8.875%).....	\$ 218,718	\$ 885,982	\$ 944,223	\$ 1,162,758
Covered Payroll.....	\$ 134,739	\$ 308,835	\$ 1,369,463	\$ 1,222,528
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability.....	\$ 1,713,245	\$ 2,291,065	\$ 250,496	\$ 404,042
Ending net pension liability.....	\$ 1,785,743	\$ 2,428,037	\$ 286,759	\$ 496,144
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	91,059	123,811	14,622	25,299
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	15,180	46,230
Total Deferred Outflows of Resources.....	\$ 91,059	\$ 123,811	\$ 29,802	\$ 71,529
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	62,130	55,658	-	934
Total Deferred Inflows of Resources.....	\$ 62,130	\$ 55,658	\$ -	\$ 934
Pension Expense				
Proportionate share of plan pension expense.....	\$ 175,094	\$ 238,071	\$ 28,117	\$ 48,647
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(15,533)	(13,915)	3,796	11,324
Total Employer Pension Expense.....	\$ 159,561	\$ 224,156	\$ 31,913	\$ 59,971
Contributions				
Statutory required contribution.....	\$ 110,203	\$ 147,603	\$ 24,608	\$ 37,103
Contribution in relation to statutory required contribution.....	(110,203)	(147,603)	(24,608)	(37,103)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	30.25%	23.38%	12.88%	10.10%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 7,583	\$ 17,515	\$ 7,508	\$ 17,746
June 30, 2018.....	7,583	17,515	7,508	17,746
June 30, 2019.....	7,583	17,515	7,508	17,746
June 30, 2020.....	6,180	15,608	7,278	17,357
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 28,929	\$ 68,153	\$ 29,802	\$ 70,595
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 2,144,346	\$ 2,915,612	\$ 344,343	\$ 595,772
Current discount rate (7.875%).....	\$ 1,785,743	\$ 2,428,037	\$ 286,759	\$ 496,144
1% increase (8.875%).....	\$ 1,480,376	\$ 2,012,829	\$ 237,721	\$ 411,299
Covered Payroll.....	\$ 364,332	\$ 631,262	\$ 191,066	\$ 367,510
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Greater Lowell Regional Vocational Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability.....	\$ 13,955,534	\$ 7,593,692	\$ 1,329,916	\$ 7,427,692
Ending net pension liability.....	\$ 14,784,348	\$ 8,509,375	\$ 1,399,262	\$ 7,913,832
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	753,888	433,913	71,351	403,544
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	304,843	-	-
Total Deferred Outflows of Resources.....	\$ 753,888	\$ 738,756	\$ 71,351	\$ 403,544
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	159,254	-	36,033	95,800
Total Deferred Inflows of Resources.....	\$ 159,254	\$ -	\$ 36,033	\$ 95,800
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,449,623	\$ 834,354	\$ 137,199	\$ 775,959
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(39,813)	76,211	(9,008)	(23,951)
Total Employer Pension Expense.....	\$ 1,409,810	\$ 910,565	\$ 128,191	\$ 752,008
Contributions				
Statutory required contribution.....	\$ 1,128,497	\$ 707,990	\$ 89,676	\$ 548,534
Contribution in relation to statutory required contribution.....	(1,128,497)	(707,990)	(89,676)	(548,534)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	22.10%	15.11%	31.66%	19.38%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 151,565	\$ 186,362	\$ 9,105	\$ 78,491
June 30, 2018.....	151,565	186,362	9,105	78,491
June 30, 2019.....	151,565	186,362	9,105	78,491
June 30, 2020.....	139,939	179,670	8,003	72,271
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 594,634	\$ 738,756	\$ 35,318	\$ 307,744
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 17,753,219	\$ 10,218,158	\$ 1,680,245	\$ 9,503,014
Current discount rate (7.875%).....	\$ 14,784,348	\$ 8,509,375	\$ 1,399,262	\$ 7,913,832
1% increase (8.875%).....	\$ 12,256,157	\$ 7,054,233	\$ 1,159,978	\$ 6,560,525
Covered Payroll.....	\$ 5,107,305	\$ 4,686,751	\$ 283,285	\$ 2,829,979
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical Schoo
Net Pension Liability				
Beginning net pension liability.....	\$ 3,059,922	\$ 625,314	\$ 10,106,977	\$ 6,940,284
Ending net pension liability.....	\$ 3,156,315	\$ 748,681	\$ 10,991,588	\$ 7,364,846
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	160,948	38,177	560,487	375,550
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	57,312	102,710	-
Total Deferred Outflows of Resources.....	<u>\$ 160,948</u>	<u>\$ 95,489</u>	<u>\$ 663,197</u>	<u>\$ 375,550</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	106,167	14,916	9,232	103,486
Total Deferred Inflows of Resources.....	<u>\$ 106,167</u>	<u>\$ 14,916</u>	<u>\$ 9,232</u>	<u>\$ 103,486</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 309,480	\$ 73,409	\$ 1,077,739	\$ 722,131
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(26,542)	10,599	23,369	(25,871)
Total Employer Pension Expense.....	<u>\$ 282,938</u>	<u>\$ 84,008</u>	<u>\$ 1,101,108</u>	<u>\$ 696,260</u>
Contributions				
Statutory required contribution.....	\$ 230,992	\$ 39,106	\$ 836,323	\$ 520,323
Contribution in relation to statutory required contribution.....	(230,992)	(39,106)	(836,323)	(520,323)
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Contributions as a percentage of covered payroll.....	28.30%	7.79%	16.76%	19.19%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 14,315	\$ 20,290	\$ 165,651	\$ 69,464
June 30, 2018.....	14,315	20,290	165,651	69,464
June 30, 2019.....	14,315	20,290	165,651	69,464
June 30, 2020.....	11,836	19,703	157,012	63,672
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	<u>\$ 54,781</u>	<u>\$ 80,573</u>	<u>\$ 653,965</u>	<u>\$ 272,064</u>
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 3,790,139	\$ 899,018	\$ 13,198,831	\$ 8,843,792
Current discount rate (7.875%).....	\$ 3,156,315	\$ 748,681	\$ 10,991,588	\$ 7,364,846
1% increase (8.875%).....	\$ 2,616,570	\$ 620,648	\$ 9,111,978	\$ 6,105,423
Covered Payroll.....	\$ 816,229	\$ 502,236	\$ 4,990,136	\$ 2,710,777
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 6,035,168	\$ 1,332,112	\$ 1,170,186	\$ 388,273
Ending net pension liability.....	\$ 6,481,194	\$ 1,446,469	\$ 1,248,093	\$ 447,164
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	330,491	73,759	63,643	22,802
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	298	11,879	2,640	22,435
Total Deferred Outflows of Resources.....	\$ 330,789	\$ 85,638	\$ 66,283	\$ 45,237
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	7,715	23,553	6,309	3,323
Total Deferred Inflows of Resources.....	\$ 7,715	\$ 23,553	\$ 6,309	\$ 3,323
Pension Expense				
Proportionate share of plan pension expense.....	\$ 635,489	\$ 141,828	\$ 122,376	\$ 43,845
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,854)	(2,918)	(917)	4,778
Total Employer Pension Expense.....	\$ 633,635	\$ 138,910	\$ 121,459	\$ 48,623
Contributions				
Statutory required contribution.....	\$ 490,299	\$ 82,136	\$ 99,575	\$ 30,339
Contribution in relation to statutory required contribution.....	(490,299)	(82,136)	(99,575)	(30,339)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	21.08%	10.20%	27.94%	11.62%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 82,043	\$ 15,806	\$ 15,239	\$ 10,566
June 30, 2018.....	82,043	15,806	15,239	10,566
June 30, 2019.....	82,043	15,806	15,239	10,566
June 30, 2020.....	76,945	14,667	14,257	10,216
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 323,074	\$ 62,085	\$ 59,974	\$ 41,914
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 7,782,695	\$ 1,736,941	\$ 1,498,725	\$ 536,954
Current discount rate (7.875%).....	\$ 6,481,194	\$ 1,446,469	\$ 1,248,093	\$ 447,164
1% increase (8.875%).....	\$ 5,372,881	\$ 1,199,119	\$ 1,034,663	\$ 370,693
Covered Payroll.....	\$ 2,325,406	\$ 805,254	\$ 356,427	\$ 260,997
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 390,851	\$ 228,202	\$ 253,992	\$ 753,333
Ending net pension liability.....	\$ 442,908	\$ 266,258	\$ 271,567	\$ 827,882
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	22,585	13,577	13,848	42,216
Changes of assumptions.....	-	-		
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	17,219	17,538	2,514	15,079
Total Deferred Outflows of Resources.....	\$ 39,804	\$ 31,115	\$ 16,362	\$ 57,295
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,218	-	879	-
Total Deferred Inflows of Resources.....	\$ 4,218	\$ -	\$ 879	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 43,428	\$ 26,107	\$ 26,627	\$ 81,175
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,250	4,385	409	3,770
Total Employer Pension Expense.....	\$ 46,678	\$ 30,492	\$ 27,036	\$ 84,945
Contributions				
Statutory required contribution.....	\$ 28,891	\$ 22,778	\$ 24,091	\$ 65,147
Contribution in relation to statutory required contribution.....	(28,891)	(22,778)	(24,091)	(65,147)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	16.22%	23.27%	19.96%	18.91%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 8,983	\$ 7,832	\$ 3,924	\$ 14,487
June 30, 2018.....	8,983	7,832	3,924	14,487
June 30, 2019.....	8,983	7,832	3,924	14,487
June 30, 2020.....	8,637	7,619	3,711	13,834
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 35,586	\$ 31,115	\$ 15,483	\$ 57,295
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 531,842	\$ 319,728	\$ 326,095	\$ 994,131
Current discount rate (7.875%).....	\$ 442,908	\$ 266,258	\$ 271,567	\$ 827,882
1% increase (8.875%).....	\$ 367,164	\$ 220,728	\$ 225,123	\$ 686,311
Covered Payroll.....	\$ 178,070	\$ 97,892	\$ 120,677	\$ 344,529
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 57,928	\$ 394,227	\$ 186,991	\$ 354,194
Ending net pension liability.....	\$ 119,574	\$ 441,841	\$ 214,474	\$ 367,115
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	6,097	22,531	10,937	18,720
Changes of assumptions.....	-	-		
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	47,368	13,742	13,007	978
Total Deferred Outflows of Resources.....	\$ 53,465	\$ 36,273	\$ 23,944	\$ 19,698
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	14,458	-	9,826
Total Deferred Inflows of Resources.....	\$ -	\$ 14,458	\$ -	\$ 9,826
Pension Expense				
Proportionate share of plan pension expense.....	\$ 11,724	\$ 43,323	\$ 21,030	\$ 35,996
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	11,841	(180)	3,251	(2,213)
Total Employer Pension Expense.....	\$ 23,565	\$ 43,143	\$ 24,281	\$ 33,783
Contributions				
Statutory required contribution.....	\$ 15,190	\$ 16,010	\$ 20,105	\$ 29,540
Contribution in relation to statutory required contribution.....	(15,190)	(16,010)	(20,105)	(29,540)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	5.85%	9.51%	14.35%	78.70%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 13,389	\$ 5,540	\$ 6,027	\$ 2,539
June 30, 2018.....	13,389	5,540	6,027	2,539
June 30, 2019.....	13,389	5,540	6,027	2,539
June 30, 2020.....	13,298	5,195	5,863	2,255
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 53,465	\$ 21,815	\$ 23,944	\$ 9,872
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 143,583	\$ 530,572	\$ 257,548	\$ 440,834
Current discount rate (7.875%).....	\$ 119,574	\$ 441,841	\$ 214,474	\$ 367,115
1% increase (8.875%).....	\$ 99,124	\$ 366,287	\$ 177,802	\$ 304,335
Covered Payroll.....	\$ 259,737	\$ 168,284	\$ 140,089	\$ 37,533
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability.....	\$ 388,239	\$ 317,690	\$ 387,394	\$ 90,362
Ending net pension liability.....	\$ 427,017	\$ 358,461	\$ 399,306	\$ 100,348
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	21,775	18,279	20,361	5,117
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	9,723	12,853	746	3,400
Total Deferred Outflows of Resources.....	\$ 31,498	\$ 31,132	\$ 21,107	\$ 8,517
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	7,828	12,399	-
Total Deferred Inflows of Resources.....	\$ -	\$ 7,828	\$ 12,399	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 41,870	\$ 35,147	\$ 39,151	\$ 9,840
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,431	1,256	(2,913)	849
Total Employer Pension Expense.....	\$ 44,301	\$ 36,403	\$ 36,238	\$ 10,689
Contributions				
Statutory required contribution.....	\$ 35,704	\$ 17,865	\$ 31,734	\$ 8,913
Contribution in relation to statutory required contribution.....	(35,704)	(17,865)	(31,734)	(8,913)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	17.79%	8.98%	23.01%	12.04%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 7,959	\$ 5,896	\$ 2,256	\$ 2,148
June 30, 2018.....	7,959	5,896	2,256	2,148
June 30, 2019.....	7,959	5,896	2,256	2,148
June 30, 2020.....	7,621	5,616	1,940	2,073
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 31,498	\$ 23,304	\$ 8,708	\$ 8,517
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 512,773	\$ 430,440	\$ 479,483	\$ 120,502
Current discount rate (7.875%).....	\$ 427,017	\$ 358,461	\$ 399,306	\$ 100,348
1% increase (8.875%).....	\$ 353,999	\$ 297,160	\$ 331,017	\$ 83,190
Covered Payroll.....	\$ 200,678	\$ 199,020	\$ 137,892	\$ 74,023
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability.....	\$ 8,010	\$ 326,402	\$ 76,277	\$ 10,524
Ending net pension liability.....	\$ 12,029	\$ 372,014	\$ 84,100	\$ 24,760
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	613	18,970	4,288	1,262
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,596	15,972	4,803	12,944
Total Deferred Outflows of Resources.....	\$ 4,209	\$ 34,942	\$ 9,091	\$ 14,206
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ -
Changes of assumptions.....	-	-	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	546	-	-
Total Deferred Inflows of Resources.....	\$ -	\$ 546	\$ -	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,179	\$ 36,477	\$ 8,246	\$ 2,427
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	899	3,857	1,200	3,236
Total Employer Pension Expense.....	\$ 2,078	\$ 40,334	\$ 9,446	\$ 5,663
Contributions				
Statutory required contribution.....	\$ 2,247	\$ 28,014	\$ 10,459	\$ 5,603
Contribution in relation to statutory required contribution.....	(2,247)	(28,014)	(10,459)	(5,603)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	8.33%	15.11%	12.43%	3.09%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense				
June 30, 2017.....	\$ 1,055	\$ 8,673	\$ 2,289	\$ 3,556
June 30, 2018.....	1,055	8,673	2,289	3,556
June 30, 2019.....	1,055	8,673	2,289	3,556
June 30, 2020.....	1,044	8,377	2,224	3,538
June 30, 2021.....	-	-	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	\$ 4,209	\$ 34,396	\$ 9,091	\$ 14,206
Discount Rate Sensitivity				
1% decrease (6.875%).....	\$ 14,437	\$ 446,721	\$ 100,984	\$ 29,727
Current discount rate (7.875%).....	\$ 12,029	\$ 372,014	\$ 84,100	\$ 24,760
1% increase (8.875%).....	\$ 9,967	\$ 308,399	\$ 69,715	\$ 20,522
Covered Payroll.....	\$ 26,970	\$ 185,390	\$ 84,128	\$ 181,438
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2015

	Ayer-Shirley Regional School District	Totals
Net Pension Liability		
Beginning net pension liability.....	\$ 4,313,770	\$ 1,201,315,715
Ending net pension liability.....	\$ 4,808,243	\$ 1,290,018,945
Deferred Outflows of Resources		
Differences between expected and actual experience.....	\$ -	\$ -
Net difference between projected and actual investment earnings on pension plan investments.....	245,184	65,781,032
Changes of assumptions.....	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	154,285	9,080,216
Total Deferred Outflows of Resources.....	<u>\$ 399,469</u>	<u>\$ 74,861,248</u>
Deferred Inflows of Resources		
Differences between expected and actual experience.....	\$ -	\$ -
Changes of assumptions.....	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	9,080,216
Total Deferred Inflows of Resources.....	<u>\$ -</u>	<u>\$ 9,080,216</u>
Pension Expense		
Proportionate share of plan pension expense.....	\$ 471,455	\$ 126,799,616
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	38,571	-
Total Employer Pension Expense.....	<u>\$ 510,026</u>	<u>\$ 126,799,616</u>
Contributions		
Statutory required contribution.....	\$ 400,447	\$ 98,792,642
Contribution in relation to statutory required contribution.....	(400,447)	(99,820,481)
Contribution deficiency/(excess).....	\$ -	\$ (1,027,839)
Contributions as a percentage of covered payroll.....	10.40%	22.85%
Deferred Inflows/(Outflows) Recognized in Future Pension Expense		
June 30, 2017.....	\$ 100,812	\$ 16,698,816
June 30, 2018.....	100,812	16,698,816
June 30, 2019.....	100,812	16,698,817
June 30, 2020.....	97,033	15,684,583
June 30, 2021.....	-	-
Total Deferred Inflows/(Outflows) Recognized in Future Pension Expense.....	<u>\$ 399,469</u>	<u>\$ 65,781,032</u>
Discount Rate Sensitivity		
1% decrease (6.875%).....	\$ 5,773,800	\$ 1,549,069,449
Current discount rate (7.875%).....	\$ 4,808,243	\$ 1,290,018,945
1% increase (8.875%).....	\$ 3,986,015	\$ 1,069,419,459
Covered Payroll.....	\$ 3,851,372	\$ 432,382,921
See notes to schedule of employer allocations and schedule of pension amounts by employer.		Concluded

NOTE I – Schedule of Employer Allocations

Governmental Accounting Standards Board (GASB) Statement #68 requires employers participating in a cost-sharing pension plan to recognize pension liabilities as employees provide services to the government and earn their pension benefits. Employers participating in cost-sharing plans are required to recognize their proportionate share of the plan's collective pension amounts for all benefits provided through the plan including the net pension liability, deferred outflows of resources, deferred inflows of resources, pension expense, and contributions.

GASB Statement #68 requires the allocation of the collective pension amounts be consistent with the manner in which contributions to the plan are determined. As permissible under GASB Statement #68, The Schedule of Employer Allocations is used to demonstrate the allocation of Middlesex County Retirement System's collective pension amounts.

Massachusetts General Law (MGL) Chapter 32 Section 22 Paragraph 7c dictates that Massachusetts cost sharing defined benefit pension plans allocate the annual required pension fund appropriation to employer units based on their proportionate share of the aggregate of the annual rates of regular compensation of all members in service of the system. The Public Employee Retirement Administration Commission (PERAC) approves each system's proportionate share of the annual required contribution. PERAC can accept alternative allocation methodologies and as such the System has elected to use an actuarial based allocation methodology. Accordingly, the each member unit's proportionate share of the net pension liability has been calculated based on each member unit's actual current employees, retirees, inactive participants, and actual share of net position as of December 31, 2015.

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County and Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2015, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the System's funding schedule. No assets have been allocated to cover the remaining liability and therefore the liability has been allocated to the remaining member units.

The current employees, retirees, beneficiaries and inactive participants of the Middlesex County Retirement System have been identified and their total pension liability has been actuarially determined. For transparency purposes, the System has historically paid a contribution as an employer to itself. However with the implementation of GASB 67 & 68 the net pension liability is allocated to each member unit.

When a member unit accepts an Early Retirement Incentive Program (E.R.I. or ERIP), PERAC completes an analysis of the costs and liabilities attributable to the additional benefits payable in accordance with the ERIP. The accrued liability for the members who accept the ERIP as retirees including the ERIP less the accrued liability for the members as active employees excluding the ERIP represents the increase in accrued liability due to the ERIP. The net increase is amortized for each member unit accepting the ERIP, and is separately identified in the system's funding schedule. The 2002 ERIP amortization is straight line ending in fiscal 2019. The 2003 ERIP amortization is straight line ending in fiscal 2020. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE II – Schedule of Pension Amounts by Employer

The Schedule of Pension Amounts by Employer presents the net pension liability, the various categories of deferred outflows of resources and deferred inflows of resources, covered payroll, pension expense, and contributions for all participating employers including differences between expected and actual economic experience; differences between projected and actual investment earnings, net; and changes of assumptions. Since the system performs an actuarial valuation bi-annually, there are no reported differences between expected and actual experience or a change of assumptions as of December 31, 2015.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2014

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2014

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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

Report on the Financial Statements

We have audited the accompanying financial statements of Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2014, and the related notes to the financial statements, which collectively comprise the Middlesex County Retirement System's financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in *Government Auditing Standards*, issued by the Comptroller General of the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Middlesex County Retirement System as of December 31, 2014 and the results of its operations and changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the Schedule of Changes in the Net Pension Liability and Related Ratios; the Schedule of Contributions; and the Schedule of Investment Return be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated September 28, 2015, on our consideration of the Middlesex County Retirement System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Middlesex County Retirement System's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System, the Public Employee Retirement Commission and all member units and is not intended to be and should not be used by anyone other than these specified parties.



September 28, 2015

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STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2014

Assets	
Cash.....	\$ 52,174,629
Investments:	
PRIT funds.....	1,003,799,871
Pooled alternative investments.....	7,116,430
Pooled real estate funds.....	<u>17,581,266</u>
Total investments.....	<u>1,028,497,567</u>
Receivables:	
Member deductions.....	2,804,503
Members contributions.....	3,816
Member make-up payments and redeposits.....	209,889
Reimbursements from other systems.....	924,125
Pension fund appropriations.....	2,726,473
Other.....	<u>853,315</u>
Total receivables.....	<u>7,522,121</u>
Prepaid expenses.....	<u>61,077</u>
Capital assets, net of accumulated depreciation.....	<u>5,488,201</u>
Total assets.....	<u>1,093,743,595</u>
Liabilities	
Accounts payable.....	165,081
Other.....	<u>17,840</u>
Total liabilities.....	<u>182,921</u>
Net Position Restricted for Pensions	\$ <u><u>1,093,560,674</u></u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

FOR THE YEAR ENDED DECEMBER 31, 2014

Additions:	
Contributions:	
Member contributions.....	\$ 39,048,869
Member contributions - transfers from other systems.....	3,725,040
Retirement benefits - 3(8)c contributions from other systems.....	1,831,891
Members' makeup payments and redeposits.....	758,111
Employer - federal grant contributions.....	32,261
Employer contributions.....	<u>93,368,685</u>
 Total contributions.....	 <u>138,764,857</u>
Net investment income (loss):	
Total investment income (loss).....	80,380,141
 Less, investment expenses.....	 <u>(5,522,439)</u>
Net investment income (loss).....	<u>74,857,702</u>
 Miscellaneous.....	 <u>105,191</u>
 Total additions.....	 <u>213,727,750</u>
Deductions:	
Administration.....	2,996,390
Member contributions - transfers to other systems.....	3,882,249
Retirement benefits - 3(8)c payments to other systems.....	3,205,986
Retirement benefits and refunds.....	123,551,373
Building operations and maintenance.....	381,899
Depreciation.....	<u>162,594</u>
 Total deductions.....	 <u>134,180,491</u>
 Net increase (decrease) in fiduciary net position.....	 79,547,259
 Fiduciary net position at beginning of year.....	 <u>1,014,013,415</u>
 Fiduciary net position at end of year.....	 <u>\$ 1,093,560,674</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week. As of January 1, 2014, the System had 71 participating employers.

Instituted in 1937, the System is a member of the Massachusetts Contributory Retirement System and is governed by Chapter 32 of the Massachusetts General Laws. Membership in the Plan is mandatory immediately upon the commencement of employment for all permanent, full-time employees.

Massachusetts contributory retirement system benefits are, with certain exceptions, uniform from system to system. The System provides for retirement allowance benefits up to a maximum of 80% of a member's highest three-year average annual rate of regular compensation for those hired prior to April 2, 2012 and the highest five-year average for members hired after that date. Benefit payments are based upon a member's age, length of creditable service, level of compensation, and group classification.

Members become vested after ten years of creditable service. A superannuation retirement allowance may be received upon the completion of 20 years of service or upon reaching the age of 55 with 10 years of service. Normal retirement for most employees occurs at age 65 (except for certain hazardous duty and public safety positions, whose normal retirement is at age 55).

A retirement allowance consists of two parts: an annuity and a pension. A member's accumulated total deductions and the interest they generate constitute the annuity. The differential between the total retirement benefit and the annuity is the pension.

Active members contribute between 5 and 11% of their gross regular compensation. The percentage rate is keyed to the date upon which an employee's membership commences. These deductions are deposited in the Annuity Savings Fund and earn interest at a rate determined by the Public Employee Retirement Administration Commission's (PERAC) actuary. When a member's retirement becomes effective, his/her deductions and related interest are transferred to the Annuity Reserve Fund. Any cost-of-living adjustments granted between 1981 and 1997 and any increase in other benefits imposed by the Commonwealth of Massachusetts' state law during those years are borne by the Commonwealth and are deposited into the Pension Fund. Cost-of-living adjustments granted after 1997 must be approved by the System and all costs are borne by the System.

The pension portion of any retirement benefit is paid from the Pension Fund of the System. The governmental unit employing the member must annually appropriate and contribute the amount of current-year pension assessment. In past years, retirement systems were paying only the actual retirement benefits that were due each year. Systems had no statutory authorization to put aside money for the future benefits of employees who are currently employed. Large unfunded liabilities resulted from operating under this pay-as-you-go basis. In 1977, legislation authorized local governments to appropriate funds to meet future pension obligations. In 1983, additional legislation was passed requiring the transfer of investment earnings (in excess of the amount credited to member accounts) into the Pension Reserve Fund. These initiatives have significantly reduced the rate of growth of the Retirement Systems' unfunded liabilities, and in some Systems have actually reduced such liability.

Administrative expenses, which were previously appropriated from the governmental entities whose employees are members of the system, are now paid from investment income.

Members who become permanently and totally disabled for further duty may be eligible to receive a disability retirement allowance. The amount of benefits to be received in such cases is dependent on several factors, including whether or not the disability is work related, the member's age, years of creditable service, level of compensation, veterans' status and group classification.

Survivor benefits are extended to eligible beneficiaries of members whose death occurs prior to or following retirement.

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

The accompanying financial statements of the Middlesex County Retirement System have been prepared in accordance with accounting principles generally accepted in the United States of America (GAAP). The Governmental Accounting Standards Board (GASB) is the recognized standard-setting body for establishing governmental accounting and financial reporting principles.

MCRS is a special-purpose government engaged only in fiduciary activities. Accordingly, the financial statements are reported using the flow of economic resources measurement focus and use the accrual basis of accounting. Under this method, additions are recorded when earned and deductions are recorded when the liabilities are incurred.

Cash and Investments

Cash and cash equivalents are considered to be cash on hand, demand deposits and short-term investments with an original maturity of three months or less from the date of acquisition. Investments are carried at fair value. The fair values were determined by the closing price for those securities traded on national stock exchanges and at the average bid-and-asked quotation for those securities traded in the over-the-counter market. The fair value of private equities are based on management's valuation of estimates and assumptions from information and representations provided by the respective general partners, in the absence of readily ascertainable market values. Real estate assets are reported at fair value utilizing an income approach to valuation along with independent appraisals and estimates by management.

Accounts Receivable

Accounts receivable consist of member deductions, pension fund appropriations, and other miscellaneous reimbursements. These receivables are considered 100% collectible and therefore do not report an allowance for uncollectibles.

Deferred Outflows/Inflows of Resources

In addition to assets, the statement of fiduciary net position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, *deferred outflows of resources*, represents a consumption of fiduciary net position that applies to a future period(s) and so will not be recognized as an outflow of resources (deduction) until then. The MCRS did not have any items that qualify for reporting in this category.

In addition to liabilities, the statement of fiduciary net position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, *deferred inflows of resources*, represents an acquisition of net position that applies to a future period(s) and so will not be recognized as an inflow of resources (addition) until that time. The MCRS did not have any items that qualify for reporting in this category.

NOTE 3 – PLAN ADMINISTRATION

The System is administered by a five-person Board of Retirement consisting of a first member, who shall serve as Chairman/Treasurer, who shall be appointed by the other four members, a second member elected by the Advisory Council consisting of representatives from the member units, a third and fourth member who shall be elected by the members in or retired from the service of such system, and a fifth member who shall be chosen by the other four members.

Chairman	Thomas F. Gibson	Term Expires:	12/31/2020
Advisory Council Member	Brian P. Curtin	Term Expires:	12/31/2015
Elected Member	John Brown	Term Expires:	12/31/2017
Elected Member	Edgar W. McLean, Jr.	Term Expires:	12/31/2016
Appointed Member	Robert W. Healy	Term Expires:	12/17/2015

Board members are required to meet at least once a month. The Board must keep a record of all of its proceedings. The Board must annually submit to the appropriate authority an estimate of the expenses of administration and cost of operation of the System. The Board must annually file a financial statement of condition for the System with the Executive Director of PERAC.

The investment of the System's funds is the responsibility of the Board. All retirement allowances must be approved by the Retirement Board. The PERAC Actuary performs verification prior to payment, unless the System has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the System must be approved by a majority vote of the Board. Payments shall be made only upon vouchers signed by three persons designated by the Board.

The following retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts as follows:

Treasurer-Custodian:	)	\$10,000,000 Fiduciary
Ex-Officio Member:	)	RLI Insurance Company
Elected Members:)	
Appointed Members:	)	\$1,000,000 Fidelity
Staff Employees:	)	National Union Fire Insurance

NOTE 4 – OFFICE BUILDING

The MCRS owns an office building that was purchased as an investment and for the administrative offices of the System. The building is a two story, 1986-built office building consisting of 62,307 square feet of net rentable area. The property is situated on a 4.23 acre site in Billerica, Middlesex County, Massachusetts

NOTE 5 – CASH AND INVESTMENTSCustodial Credit Risk - Deposits

At December 31, 2014, the carrying amount of the System's deposits totaled \$5,673,508 and the bank balance totaled \$7,609,840 which was covered by Federal Depository Insurance.

Investments

The System's investments are as follows:

<u>Other Investments</u>	
PRIT Pooled Funds.....	\$ 1,003,799,871
Money Market Mutual Funds.....	46,501,121
Pooled Alternative Investments.....	7,116,430
Pooled Real Estate Funds.....	<u>17,581,266</u>
Total Investments.....	<u>\$ 1,074,998,688</u>

Approximately 93% of the Retirement System's investments are in Pension Reserve Investment Trust (PRIT). This investment pool was established by the Treasurer of the Commonwealth of Massachusetts, who serves as Trustee. PRIT is administered by the Pension Reserves Investment Management Board. The fair values of the positions in each investment Pool are the same as the value of each Pool's shares. The Administration does not have the ability to control any of the investment decisions relative to its funds in PRIT.

Approximately 2% of the System's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

The Administration's annual money-weighted rate of return on pension plan investments was 7.54%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

NOTE 6 – CAPITAL ASSETS

Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

<u>Capital Asset Type</u>	<u>Estimated Useful Life (in years)</u>
Building.....	40
Building improvements.....	40
Ford Pick-up truck with plow.....	5

Capital asset activity for the year ended December 31, 2014, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
Construction in progress.....	-	267,270	-	267,270
Total capital assets not being depreciated.....	<u>672,657</u>	<u>267,270</u>	<u>-</u>	<u>939,927</u>
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,086,623	-	-	1,086,623
Ford Pick-up truck with plow.....	19,603	-	-	19,603
Total capital assets being depreciated.....	<u>6,523,362</u>	<u>-</u>	<u>-</u>	<u>6,523,362</u>
<u>Less accumulated depreciation for:</u>				
Buildings.....	(1,494,070)	(135,428)	-	(1,629,498)
Building improvements.....	(298,821)	(27,166)	-	(325,987)
Ford Pick-up truck with plow.....	(19,603)	-	-	(19,603)
Total accumulated depreciation.....	<u>(1,812,494)</u>	<u>(162,594)</u>	<u>-</u>	<u>(1,975,088)</u>
Total capital assets being depreciated, net.....	<u>4,710,868</u>	<u>(162,594)</u>	<u>-</u>	<u>4,548,274</u>
Total capital assets, net.....	<u>\$ 5,383,525</u>	<u>\$ 104,676</u>	<u>\$ -</u>	<u>\$ 5,488,201</u>

NOTE 7 – MEMBERSHIP

The following table represents the System's membership at January 1, 2014:

Active members.....	10,224
Inactive members.....	1,840
Disabled members.....	454
Retirees and beneficiaries currently receiving benefits.....	<u>4,813</u>
Total.....	<u>17,331</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2014 were as follows:

Total pension liability.....	\$ 2,294,876,389
The pension plan's fiduciary net position.....	<u>1,093,560,674</u>
The net pension liability.....	\$ <u>1,201,315,715</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	47.65%

The total pension liability was determined by an actuarial valuation as of January 1, 2014, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2014:

Valuation date.....	January 1, 2014
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.5% for fiscal 2016 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, 2014, 5 years remaining for 2002 ERI liability, 6 years remaining for 2003 ERI liability, 8 years remaining for 2010 ERI liability, and 21 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.
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 (previously, 4.75% for group 1 and 5.25% for group 4).
Cost of living adjustments.....	3.0% of the first \$14,000 of retirement income.
Rates of retirement.....	Varies based upon age for general employees, police and fire employees.
Rates of disability.....	For general employees, it was assumed that 45% of all disabilities are ordinary (55% are service connected). For police and fire employees, 10% of all disabilities are assumed to be ordinary (90% are service connected).
Mortality Rates:	
Pre-Retirement.....	The RP-2000 Employee Mortality Table projected 22 years with Scale AA.
Post-Retirement.....	The RP-2000 Employee Mortality Table projected 17 years with Scale AA.
Disabled Retiree.....	The RP-2000 Healthy Annuitant Mortality Table set forward three years projected 17 years with Scale AA.
Investment rate of return/Discount rate.....	7.875%, net of pension plan investment expense, including inflation previously 8.0%

Investment policy: The pension plan's policy in regard to the allocation of invested assets is established by PRIT. Plan assets are managed on a total return basis with a long-term objective of achieving a fully funded status for the benefits provided through the pension plan.

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 January 1, 2014 are summarized in the following table:

Asset Class	Long-Term Expected Real Rate of Return	Long-Term Expected Asset Allocation
Domestic equity.....	6.60%	19.60%
International developed markets equity.....	7.10%	15.60%
International emerging markets equity.....	9.40%	6.50%
Core fixed income.....	2.20%	15.30%
High-yield fixed income.....	4.70%	8.30%
Real estate.....	4.40%	9.90%
Commodities.....	4.40%	3.90%
Short-term government money market.....	1.80%	0.00%
Hedge fund, GTAA, Risk parity.....	3.90%	9.80%
Private equity.....	11.70%	11.10%

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 contributions will be made at rates equal to the actuarially determined contribution rate. 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 position liability to changes in the discount rate. The following presents the net position liability, calculated using the discount rate of 7.875%, as well as what the net position 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

Contributions: Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The pension fund appropriations are allocated amongst employers based on the actuarial valuation.

NOTE 9 – TOWN OF ACTON SETTLEMENT

In March of 2011 the Town of Acton and the MCRS reached a settlement regarding a civil suit filed by the Town of Acton. The Town of Acton sought relief relating to increased assessments due to investment losses incurred by the System. The MCRS agreed to credit against (i.e. to reduce) Acton's annual assessment by a total credit of \$300,000, which is to be credited, at a minimum, in installments of \$37,500 per year for a period of eight years or in larger installments until the total credit of \$300,000 is paid in full to Acton, whichever is earlier. Without limiting the foregoing, the MCRS intends to fund the credit through the System's operating budget and will not increase assessments to members of the System (including Acton) to fund the credit. The Parties agree that Acton shall receive the credit for each year that Acton is a member of the MCRS so that if Acton ceases to be a member of the MCRS, any remaining amount of the credit then outstanding will be forfeited. The Parties further agree that the MCRS may, at its discretion, credit all or a part of this obligation in one year. If the MCRS credits more than \$37,500 in any given year, the remaining years' obligations will be ratably and proportionally reduced. As of December 31, 2014, the Town of Acton has been credited \$150,000.

NOTE 10 – DISPUTE WITH THE COMMONWEALTH AND STATE EMPLOYEES RETIREMENT SYSTEM

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County be transferred to the Commonwealth. Therefore the MCRS was required to transfer the Annuity Savings Fund Balances of these transferred County employees to the State Employees Retirement System (SERS). This transfer, totaling approximately \$18 million, was made during calendar year 1998.

In December of 1999, the State Legislature enacted Massachusetts General Law, Chapter 34B (Abolition of County Government). This legislation, among other things, defines the components of determining the overall surplus or deficit of an abolished County upon transfer to the Commonwealth and how regional retirement systems will be affected. Sections 8 and 18 addressed how the abolished County's unfunded liabilities in regional retirement systems will be paid for. The MCRS believes, as a result of the abolishment of Middlesex County, that the Commonwealth of Massachusetts owed them \$9,501,680 for the Unfunded Liability for retirees of the former Middlesex County.

The Commonwealth and SERS did not agree with the assertion that the MCRS was owed \$9,501,680. As a result, the MCRS acted to stop 3(8)(c) reimbursements to the State Employees Retirement System and correspondingly the State System began to intercept all COLA reimbursements which were due the MCRS. In 2012 the MCRS reinstated payments for 3(8)(c) reimbursements to the SERS. The SERS and MCRS are currently working to determine the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld. As of the date of this report no payments have been received by the MCRS.

The net effect of the above mentioned transactions cannot be reasonably estimated and no amounts are reported in these financial statements. The exact amount due to/from the Commonwealth and SERS is being discussed by the mentioned parties, but as of the date of this report there has been no resolution.

Required Supplementary Information

**SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
AND RELATED RATIOS**

	2014
Total pension liability:	
Service cost.....	\$ 52,132,389
Interest.....	172,094,226
Changes in benefit terms.....	-
Differences between expected and actual experience.....	-
Changes in assumptions.....	-
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:	
Member contributions.....	\$ 39,806,980
Employer contributions.....	93,400,946
Net investment income (loss).....	74,962,895
Retirement benefits and refunds.....	(125,082,678)
Administrative expenses.....	<u>(3,540,884)</u>
Net increase (decrease) in fiduciary net position.....	79,547,259
Fiduciary net position at beginning of year.....	<u>1,014,013,415</u>
Fiduciary net position at end of year (b)	<u>\$ 1,093,560,674</u>
Net pension liability - ending (a) - (b)	<u>\$ 1,201,315,715</u>
Plan 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%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those years for
which information is available.

*Covered employee payroll as reported in the January 1, 2014 funding
valuation report.

See notes to required supplementary information.

SCHEDULE OF CONTRIBUTIONS

	2014
Actuarially determined contribution (a)..... \$	92,826,743
Contributions in relation to the actuarially determined contribution.....	93,400,946
Contribution deficiency (excess)..... \$	(574,203)
Covered-employee payroll (*)..... \$	415,752,810
Contributions as a percentage of covered- employee payroll.....	22.47%

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those
years for which information is available.

(a) Based on the results of the January 1, 2012 actuarial
valuation (including assumptions and methods) which
determined budgeted appropriations for fiscal 2015.

*Covered employee payroll as reported in the January 1, 2014
funding valuation report.

See notes to required supplementary information.

SCHEDULE OF INVESTMENT RETURN

2014

Annual money-weighted rate of return, net of investment expense.....	7.54%
---	-------

Note: this schedule is intended to present information for 10 years.
Until a 10-year trend is compiled, information is presented for those
years for which information is available.

The annual money-weighted rate of return has been calculated by
the Pension Reserves Investment Management Board (PRIM).

See notes to required supplementary information.

NOTE A – CHANGES IN THE NET PENSION LIABILITY AND RELATED RATIOS

The Schedule of Changes in the Net Pension Liability and Related Ratios includes the detailed changes in the system's total pension liability, changes in the system's net position, and the ending net pension liability. It also demonstrates the plan's net position as a percentage of the total pension liability and the net pension liability as a percentage of covered payroll.

Since the system performs an actuarial valuation bi-annually, there are no reported amounts for the changes in benefit terms, differences between expected and actual experience and changes in assumptions as of December 31, 2014.

NOTE B – CONTRIBUTIONS

Governmental employers are required to pay an annual appropriation as established by PERAC. The total appropriation includes the amounts to pay the pension portion of each member's retirement allowance, an amount to amortize the actuarially determined unfunded liability to zero in accordance with the system's funding schedule, and additional appropriations in accordance with adopted early retirement incentive programs. The total appropriations are payable on July 1 and January 1. Employers may choose to pay the entire appropriation in July at a discounted rate. Accordingly, actual employer contributions may be less than the "total appropriation". The pension fund appropriations are allocated amongst employers based on covered payroll. In addition, an employer may contribute more than the amount required.

NOTE C – MONEY WEIGHTED RATE OF RETURN

The money weighted rate of return is calculated as the internal rate of return on pension plan investments, net of pension plan investment expense. A money weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested. Inputs to the money weighted rate of return calculation are determined monthly.

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Audit of Specific Elements, Accounts and Items of Financial Statements



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Independent Auditor's Report

To the Honorable Middlesex County Retirement Board
Middlesex County Retirement System
Billerica, Massachusetts

We have audited the accompanying schedule of employer allocations of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2014, and the related notes. We have also audited the total for all entities of the columns titled net pension liability, total deferred outflows of resources, total deferred inflows of resources, total covered payroll, total pension expense and contributions included in the accompanying schedule of pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2014, and the related notes.

Management's Responsibility for the Schedules

Management is responsible for the preparation and fair presentation of these schedules in accordance with accounting principles generally accepted in the United States of America; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of the schedules that are free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

Our responsibility is to express opinions on the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer based on our audit. We conducted our audit in accordance with auditing standards generally accepted in the United States of America. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the schedule of employer allocations and specified column totals included in the schedule of pension amounts by employer are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the schedule of employer allocations and the specified column totals included in the schedule of pension amounts by employer.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Opinions

In our opinion, the schedules referred to above present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflows of resources, total covered payroll, total pension expense and contributions for the total of all participating entities for the Middlesex County Retirement System as of and for the year ended December 31, 2014, in accordance with accounting principles generally accepted in the United States of America.

Other Matter

We have audited, in accordance with auditing standards generally accepted in the United States of America, the financial statements of the Middlesex County Retirement System as of and for the year ended December 31, 2014, and our report thereon, dated September 28, 2015, expressed an unmodified opinion on those financial statements.

Restriction on Use

This report is intended solely for the information and use of the Middlesex County Retirement System management, the Middlesex County Retirement System employers and their auditors and is not intended to be and should not be used by anyone other than these specified parties.



September 28, 2015

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2014

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	41,050,336	3.417115%
Town of Ashby.....	1,427,805	0.118853%
Town of Ashland.....	24,556,017	2.044094%
Town of Ayer.....	15,773,883	1.313051%
Town of Bedford.....	43,939,870	3.657645%
Town of Billerica.....	119,887,544	9.979687%
Town of Boxborough.....	7,339,622	0.610965%
Town of Burlington.....	98,053,205	8.162151%
Town of Carlisle.....	7,984,515	0.664648%
Town of Chelmsford.....	88,099,468	7.333582%
Town of Dracut.....	48,701,871	4.054044%
Town of Dunstable.....	2,190,299	0.182325%
Town of Groton.....	19,495,870	1.622876%
Town of Holliston.....	21,225,487	1.766853%
Town of Hopkinton.....	16,828,857	1.400869%
Town of Hudson.....	52,755,296	4.391460%
Town of Lincoln.....	21,739,395	1.809632%
Town of Littleton.....	19,021,595	1.583397%
Town of North Reading.....	41,397,005	3.445972%
Town of Pepperell.....	11,580,175	0.963958%
Town of Sherborn.....	9,464,261	0.787825%
Town of Shirley.....	8,549,600	0.711686%
Town of Stow.....	8,519,238	0.709159%
Town of Sudbury.....	48,635,848	4.048548%
Town of Tewksbury.....	81,064,434	6.747971%
Town of Townsend.....	6,742,808	0.561285%
Town of Tyngsborough.....	16,343,894	1.360499%
Town of Wayland.....	49,341,309	4.107272%
Town of Westford.....	42,997,563	3.579206%
Town of Weston.....	54,939,016	4.573237%
Town of Wilmington.....	69,798,925	5.810207%
Acton-Boxborough Regional School District.....	21,781,913	1.813171%
Acton Water Supply.....	2,562,079	0.213273%
Bedford Housing Authority.....	243,648	0.020282%
Billerica Housing Authority.....	1,012,365	0.084271%
Chelmsford Housing Authority.....	1,002,070	0.083414%
Chelmsford Water District.....	2,106,325	0.175335%
Dracut Housing Authority.....	1,713,245	0.142614%
Dracut Water Supply.....	2,291,065	0.190713%
East Chelmsford Water District.....	250,496	0.020852%
East Middlesex Mosquito Control.....	404,042	0.033633%
Greater Lowell Regional Vocational Technical School District.....	13,955,534	1.161687%
Groton-Dunstable Regional School District.....	7,593,692	0.632115%
Hudson Housing Authority.....	1,329,916	0.110705%
Lincoln-Sudbury Regional School District.....	7,427,692	0.618296%
Nashoba Valley Technical High School District.....	3,059,922	0.254714%
North Chelmsford Water District.....	625,314	0.052052%
North Middlesex Regional School District.....	10,106,977	0.841326%
Shawsheen Valley Regional Vocational School.....	6,940,284	0.577724%
South Middlesex Regional Vocational Technical School.....	6,035,168	0.502380%
Sudbury Water District.....	1,332,112	0.110888%
Tewksbury Housing Authority.....	1,170,186	0.097409%
Wayland Housing Authority.....	388,273	0.032321%
Hopkinton Housing Authority.....	390,851	0.032535%
Sudbury Housing Authority.....	228,202	0.018996%
Wilmington Housing Authority.....	253,992	0.021143%
Acton Housing Authority.....	753,333	0.062709%
Burlington Housing Authority.....	57,928	0.004822%
Ayer Housing Authority.....	394,227	0.032816%
Holliston Housing Authority.....	186,991	0.015566%
Littleton Housing Authority.....	354,194	0.029484%
Westford Housing Authority.....	388,239	0.032318%
Shirley Water District.....	317,690	0.026445%
Tyngsborough Housing Authority.....	387,394	0.032247%
Pepperell Housing Authority.....	90,362	0.007522%
Groton Housing Authority.....	8,010	0.000667%
Tyngsborough Water District.....	326,402	0.027170%
North Reading Housing Authority.....	76,277	0.006349%
West Groton Water.....	10,524	0.000876%
Ayer-Shirley Regional School District.....	4,313,770	0.359087%
Total.....	\$ 1,201,315,715	100.000%

(concluded)

See notes to schedule of employer allocations and schedule of pension amounts by employer.

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2014

Employer	Deferred Outflows of Resources		Differences Between Expected and Actual Experience	Net Difference Between Projected and Actual Investment Earnings on Pension Plan	Changes of Assumptions	Changes in Proportion and Differences Between Employer Contributions and Proportionate Share of Contributions	Total Deferred Outflows of Resources
	12/31/2013 Net Pension Liability	12/31/2014 Net Pension Liability					
Middlesex County Retirement Board.....	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Middlesex County.....	-	-	-	-	-	-	-
Middlesex Hospital.....	-	-	-	-	-	-	-
Town of Acton.....	39,712,176	41,050,336	-	138,629	-	-	138,629
Town of Ashby.....	1,444,247	1,427,805	-	4,822	-	-	4,822
Town of Ashland.....	24,485,785	24,556,017	-	82,928	-	-	82,928
Town of Ayer.....	15,638,364	15,773,883	-	53,270	-	-	53,270
Town of Bedford.....	43,191,014	43,939,870	-	148,388	-	-	148,388
Town of Billerica.....	117,182,728	119,887,544	-	404,870	-	-	404,870
Town of Boxborough.....	7,196,907	7,339,622	-	24,786	-	-	24,786
Town of Burlington.....	96,366,603	98,053,205	-	331,133	-	-	331,133
Town of Carlisle.....	7,962,135	7,984,515	-	26,964	-	-	26,964
Town of Chelmsford.....	86,318,979	88,099,468	-	297,519	-	-	297,519
Town of Dracut.....	47,998,084	48,701,871	-	164,470	-	-	164,470
Town of Dunstable.....	2,183,553	2,190,299	-	7,397	-	-	7,397
Town of Groton.....	19,227,759	19,495,870	-	65,839	-	-	65,839
Town of Holliston.....	21,181,353	21,225,487	-	71,680	-	-	71,680
Town of Hopkinton.....	17,062,284	16,828,857	-	56,832	-	-	56,832
Town of Hudson.....	51,960,035	52,755,296	-	178,159	-	-	178,159
Town of Lincoln.....	21,322,318	21,739,395	-	73,416	-	-	73,416
Town of Littleton.....	18,948,679	19,021,595	-	64,237	-	-	64,237
Town of North Reading.....	40,639,956	41,397,005	-	139,801	-	-	139,801
Town of Pepperell.....	11,461,499	11,580,175	-	39,107	-	-	39,107
Town of Sherborn.....	9,282,741	9,464,261	-	31,962	-	-	31,962
Town of Shirley.....	8,397,405	8,549,600	-	28,873	-	-	28,873
Town of Stow.....	8,406,016	8,519,238	-	28,770	-	-	28,770
Town of Sudbury.....	47,531,730	48,635,848	-	164,247	-	-	164,247
Town of Tewksbury.....	79,764,172	81,064,434	-	273,761	-	-	273,761
Town of Townsend.....	6,784,021	6,742,808	-	22,771	-	-	22,771
Town of Tyngsborough.....	16,210,108	16,343,894	-	55,195	-	-	55,195
Town of Wayland.....	48,453,302	49,341,309	-	166,629	-	-	166,629
Town of Westford.....	42,773,128	42,997,563	-	145,206	-	-	145,206
Town of Weston.....	53,924,602	54,939,016	-	186,533	-	-	186,533
Town of Wilmington.....	68,204,357	69,798,925	-	235,716	-	-	235,716
Acton-Boxborough Regional School District.....	21,494,863	21,781,913	-	73,559	-	-	73,559
Acton Water Supply.....	2,455,110	2,562,079	-	8,652	-	-	8,652
Bedford Housing Authority.....	244,485	243,648	-	823	-	-	823
Billerica Housing Authority.....	1,003,716	1,012,365	-	3,419	-	-	3,419
Chelmsford Housing Authority.....	989,833	1,002,070	-	3,384	-	-	3,384
Chelmsford Water District.....	2,651,988	2,106,325	-	7,113	-	-	7,113
Dracut Housing Authority.....	1,651,995	1,713,245	-	5,786	-	-	5,786
Dracut Water Supply.....	2,205,071	2,291,065	-	7,737	-	-	7,737
East Chelmsford Water District.....	246,232	250,496	-	846	-	-	846
East Middlesex Mosquito Control.....	405,320	404,042	-	1,364	-	-	1,364
Greater Lowell Regional Vocational Technical School District.....	13,714,384	13,955,534	-	47,129	-	-	47,129
Groton-Dunstable Regional School District.....	7,565,542	7,593,692	-	25,645	-	-	25,645
Hudson Housing Authority.....	1,270,874	1,329,916	-	4,491	-	-	4,491
Lincoln-Sudbury Regional School District.....	7,254,200	7,427,692	-	25,084	-	-	25,084
Nashoba Valley Technical High School District.....	2,956,465	3,059,922	-	10,334	-	-	10,334
North Chelmsford Water District.....	604,319	625,314	-	2,112	-	-	2,112
North Middlesex Regional School District.....	9,918,551	10,106,977	-	34,132	-	-	34,132
Shawsheen Valley Regional Vocational School.....	6,737,812	6,940,284	-	23,438	-	-	23,438
South Middlesex Regional Vocational Technical School.....	5,927,985	6,035,168	-	20,381	-	-	20,381
Sudbury Water District.....	1,292,468	1,332,112	-	4,499	-	-	4,499
Tewksbury Housing Authority.....	1,141,173	1,170,186	-	3,952	-	-	3,952
Wayland Housing Authority.....	386,391	388,273	-	1,311	-	-	1,311
Hopkinton Housing Authority.....	379,814	390,851	-	1,320	-	-	1,320
Sudbury Housing Authority.....	234,924	228,202	-	771	-	-	771
Wilmington Housing Authority.....	252,085	253,992	-	858	-	-	858
Acton Housing Authority.....	743,059	753,333	-	2,544	-	-	2,544
Burlington Housing Authority.....	74,134	57,928	-	196	-	-	196
Ayer Housing Authority.....	390,508	394,227	-	1,331	-	-	1,331
Holliston Housing Authority.....	184,893	186,991	-	632	-	-	632
Littleton Housing Authority.....	346,459	354,194	-	1,196	-	-	1,196
Westford Housing Authority.....	383,690	388,239	-	1,311	-	-	1,311
Shirley Water District.....	305,150	317,690	-	1,073	-	-	1,073
Tyngsborough Housing Authority.....	376,056	387,394	-	1,308	-	-	1,308
Pepperell Housing Authority.....	89,236	90,362	-	305	-	-	305
Groton Housing Authority.....	10,029	8,010	-	27	-	-	27
Tyngsborough Water District.....	315,593	326,402	-	1,102	-	-	1,102
North Reading Housing Authority.....	83,574	76,277	-	258	-	-	258
West Groton Water.....	16,419	10,524	-	36	-	-	36
Ayer-Shirley Regional School District.....	4,198,607	4,313,770	-	14,568	-	-	14,568
Total for All Entities.....	\$ 1,181,719,037	\$ 1,201,315,715	\$ -	\$ 4,056,937	\$ -	\$ -	\$ 4,056,937

See notes to schedule of employer allocations and schedule of p

(Continued)

Deferred Inflows of Resources				Pension Expense		
Differences Between Expected and Actual Experience	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	
					Employer Contributions	Total Employer Pension Expense
\$ -	\$ -	\$ -	\$ -	\$ 307,873	\$ -	\$ 307,873
-	-	-	-	-	-	-
-	-	-	-	-	-	-
-	-	-	-	3,712,110	-	3,712,110
-	-	-	-	129,114	-	129,114
-	-	-	-	2,220,556	-	2,220,556
-	-	-	-	1,426,404	-	1,426,404
-	-	-	-	3,973,403	-	3,973,403
-	-	-	-	10,841,214	-	10,841,214
-	-	-	-	663,709	-	663,709
-	-	-	-	8,866,774	-	8,866,774
-	-	-	-	722,025	-	722,025
-	-	-	-	7,966,676	-	7,966,676
-	-	-	-	4,404,022	-	4,404,022
-	-	-	-	198,065	-	198,065
-	-	-	-	1,762,976	-	1,762,976
-	-	-	-	1,919,383	-	1,919,383
-	-	-	-	1,521,803	-	1,521,803
-	-	-	-	4,770,566	-	4,770,566
-	-	-	-	1,965,854	-	1,965,854
-	-	-	-	1,720,089	-	1,720,089
-	-	-	-	3,743,456	-	3,743,456
-	-	-	-	1,047,174	-	1,047,174
-	-	-	-	855,836	-	855,836
-	-	-	-	773,125	-	773,125
-	-	-	-	770,379	-	770,379
-	-	-	-	4,398,052	-	4,398,052
-	-	-	-	7,330,511	-	7,330,511
-	-	-	-	609,740	-	609,740
-	-	-	-	1,477,949	-	1,477,949
-	-	-	-	4,461,846	-	4,461,846
-	-	-	-	3,888,192	-	3,888,192
-	-	-	-	4,968,036	-	4,968,036
-	-	-	-	6,311,791	-	6,311,791
-	-	-	-	1,969,699	-	1,969,699
-	-	-	-	231,684	-	231,684
-	-	-	-	22,033	-	22,033
-	-	-	-	91,546	-	91,546
-	-	-	-	90,615	-	90,615
-	-	-	-	190,471	-	190,471
-	-	-	-	154,926	-	154,926
-	-	-	-	207,177	-	207,177
-	-	-	-	22,652	-	22,652
-	-	-	-	36,537	-	36,537
-	-	-	-	1,261,974	-	1,261,974
-	-	-	-	686,684	-	686,684
-	-	-	-	120,262	-	120,262
-	-	-	-	671,673	-	671,673
-	-	-	-	276,703	-	276,703
-	-	-	-	56,546	-	56,546
-	-	-	-	913,956	-	913,956
-	-	-	-	627,597	-	627,597
-	-	-	-	545,749	-	545,749
-	-	-	-	120,461	-	120,461
-	-	-	-	105,818	-	105,818
-	-	-	-	35,111	-	35,111
-	-	-	-	35,344	-	35,344
-	-	-	-	20,636	-	20,636
-	-	-	-	22,968	-	22,968
-	-	-	-	68,123	-	68,123
-	-	-	-	5,238	-	5,238
-	-	-	-	35,649	-	35,649
-	-	-	-	16,309	-	16,309
-	-	-	-	32,029	-	32,029
-	-	-	-	35,108	-	35,108
-	-	-	-	28,728	-	28,728
-	-	-	-	35,031	-	35,031
-	-	-	-	8,171	-	8,171
-	-	-	-	724	-	724
-	-	-	-	29,516	-	29,516
-	-	-	-	6,898	-	6,898
-	-	-	-	952	-	952
-	-	-	-	390,086	-	390,086
\$ -	\$ -	\$ -	\$ -	\$ 108,940,687	\$ -	\$ 108,940,687

(Continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER (CONTINUED)

FOR THE YEAR ENDED DECEMBER 31, 2014

	Deferred Inflows/(Outflows) Recognized in Future Pension Expense				Discount Rate Sensitivity		
	June 30, 2016	June 30, 2017	June 30, 2018	June 30, 2019	1% decrease (6.875%)	Current discount rate (7.875%)	1% Increase (8.875%)
Middlesex County Retirement Board.....	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Middlesex County.....	-	-	-	-	-	-	-
Middlesex Hospital.....	-	-	-	-	-	-	-
Town of Acton.....	34,658	34,658	34,658	34,655	49,638,562	41,050,336	33,738,450
Town of Ashby.....	1,206	1,206	1,206	1,204	1,726,512	1,427,805	1,173,480
Town of Ashland.....	20,732	20,732	20,732	20,732	29,693,434	24,556,017	20,182,105
Town of Ayer.....	13,318	13,318	13,318	13,316	19,073,973	15,773,883	12,964,244
Town of Bedford.....	37,097	37,097	37,097	37,097	53,132,606	43,939,870	36,113,297
Town of Billerica.....	101,217	101,217	101,217	101,219	144,969,449	119,887,544	98,533,183
Town of Boxborough.....	6,197	6,197	6,197	6,195	8,875,154	7,339,622	6,032,286
Town of Burlington.....	82,783	82,783	82,783	82,784	118,567,099	98,053,205	80,587,790
Town of Carlisle.....	6,741	6,741	6,741	6,741	9,654,978	7,964,515	6,562,318
Town of Chelmsford.....	74,380	74,380	74,380	74,379	106,530,931	88,099,468	72,407,198
Town of Dracut.....	41,117	41,117	41,117	41,119	58,890,878	48,701,871	40,027,093
Town of Dunstable.....	1,849	1,849	1,849	1,850	2,648,535	2,190,299	1,800,163
Town of Groton.....	16,460	16,460	16,460	16,459	23,574,631	19,495,870	16,023,262
Town of Holliston.....	17,920	17,920	17,920	17,920	25,666,106	21,225,487	17,444,801
Town of Hopkinton.....	14,208	14,208	14,208	14,208	20,349,657	16,828,857	13,831,304
Town of Hudson.....	44,540	44,540	44,540	44,539	63,792,335	52,755,296	43,356,527
Town of Lincoln.....	18,354	18,354	18,354	18,354	26,287,533	21,739,355	17,867,174
Town of Littleton.....	16,059	16,059	16,059	16,060	23,001,141	19,021,595	15,633,471
Town of North Reading.....	34,950	34,950	34,950	34,951	50,057,749	41,387,005	34,023,370
Town of Pepperell.....	9,777	9,777	9,777	9,776	14,002,890	11,580,175	9,517,518
Town of Sherborn.....	7,990	7,990	7,990	7,992	11,444,302	9,464,261	7,778,491
Town of Shirley.....	7,218	7,218	7,218	7,219	10,338,273	8,549,600	7,026,742
Town of Stow.....	7,193	7,193	7,193	7,191	10,301,565	8,519,238	7,001,792
Town of Sudbury.....	41,062	41,062	41,062	41,061	58,811,040	48,635,848	39,972,829
Town of Tewksbury.....	68,440	68,440	68,440	68,441	98,024,080	81,064,434	66,625,242
Town of Townsend.....	5,693	5,693	5,693	5,692	8,153,480	6,742,808	5,541,777
Town of Tyngsborough.....	13,799	13,799	13,799	13,798	19,763,239	16,343,894	13,432,725
Town of Wayland.....	41,657	41,657	41,657	41,658	59,664,092	49,341,309	40,552,633
Town of Westford.....	36,302	36,302	36,302	36,300	51,993,166	42,997,563	35,338,840
Town of Weston.....	46,383	46,383	46,383	46,384	66,432,910	54,939,016	45,153,279
Town of Wilmington.....	58,929	58,929	58,929	58,929	84,401,636	69,786,325	57,366,347
Acton-Boxborough Regional School District.....	18,390	18,390	18,390	18,389	26,338,342	21,781,913	17,902,115
Acton Water Supply.....	2,163	2,163	2,163	2,163	3,098,100	2,562,079	2,105,724
Bedford Housing Authority.....	206	206	206	205	294,626	243,648	200,252
Billerica Housing Authority.....	855	855	855	854	1,224,159	1,012,365	823,039
Chelmsford Housing Authority.....	846	846	846	846	1,211,710	1,002,070	823,578
Chelmsford Water District.....	1,778	1,778	1,778	1,779	2,546,996	2,106,325	1,731,148
Dracut Housing Authority.....	1,446	1,446	1,446	1,448	2,071,675	1,713,245	1,408,081
Dracut Water Supply.....	1,934	1,934	1,934	1,935	2,770,383	2,291,065	1,882,981
East Chelmsford Water District.....	211	211	211	213	302,906	250,496	205,880
East Middlesex Mosquito Control.....	341	341	341	341	488,568	404,042	332,071
Greater Lowell Regional Vocational Technical School District.....	11,782	11,782	11,782	11,783	16,875,191	13,955,534	11,469,770
Groton-Dunstable Regional School District.....	6,411	6,411	6,411	6,412	9,182,389	7,593,692	6,241,108
Hudson Housing Authority.....	1,123	1,123	1,123	1,122	1,608,151	1,329,916	1,099,032
Unc on-Sudbury Regional School District.....	6,271	6,271	6,271	6,271	8,981,647	7,427,692	6,104,668
Nashoba Valley Technical High School District.....	2,583	2,583	2,583	2,585	3,700,081	3,059,922	2,514,887
North Chelmsford Water District.....	528	528	528	528	756,131	625,314	513,929
North Middlesex Regional School District.....	8,533	8,533	8,533	8,533	12,221,482	10,106,977	8,306,726
Shawsheen Valley Regional Vocational School.....	5,859	5,859	5,859	5,861	8,392,280	6,940,284	5,704,085
South Middlesex Regional Vocational Technical School.....	5,095	5,095	5,095	5,096	7,297,799	6,035,168	4,960,186
Sudbury Water District.....	1,125	1,125	1,125	1,124	1,610,809	1,332,112	1,094,839
Tewksbury Housing Authority.....	988	988	988	988	1,415,007	1,170,186	961,755
Wayland Housing Authority.....	328	328	328	327	469,509	388,273	319,117
Hopkinton Housing Authority.....	330	330	330	330	472,618	390,851	321,230
Sudbury Housing Authority.....	193	193	193	192	275,944	228,202	187,555
Wilmington Housing Authority.....	214	214	214	216	307,133	253,992	208,753
West Groton Water.....	636	636	636	636	910,939	753,333	619,149
Burlington Housing Authority.....	49	49	49	49	70,047	57,928	47,609
Ayer Housing Authority.....	333	333	333	332	476,700	394,227	324,005
Holliston Housing Authority.....	158	158	158	158	226,119	186,991	153,689
Littleton Housing Authority.....	299	299	299	299	428,298	354,194	291,107
Westford Housing Authority.....	328	328	328	327	469,466	388,239	319,088
Shirley Water District.....	268	268	268	269	384,152	317,690	261,101
Tyngsborough Housing Authority.....	327	327	327	327	468,435	387,394	318,387
Pepperell Housing Authority.....	76	76	76	77	109,268	90,362	74,268
Groton Housing Authority.....	7	7	7	6	9,689	8,010	6,586
Tyngsborough Water District.....	276	276	276	274	394,684	326,402	268,260
North Reading Housing Authority.....	64	64	64	66	92,228	76,277	62,686
West Groton Water.....	9	9	9	9	12,725	10,524	8,649
Ayer-Shirley Regional School District.....	3,642	3,642	3,642	3,642	5,216,260	4,313,770	3,545,400
Total for All Entities.....	\$ 1,014,234	\$ 1,014,234	\$ 1,014,234	\$ 1,014,235	\$ 1,452,645,252	\$ 1,201,315,715	\$ 987,337,404

See notes to schedule of employer allocations and schedule of pension amounts by employer.

Schedule of Contributions

Statutory Required Contribution	Contribution in Relation to the Statutory Required Contribution	Contribution Deficiency/ (Excess)	Covered Employer Payroll	Contributions as a Percentage of Covered Employee Payroll
\$ 307,873	\$ (307,873)	\$ -	\$ 1,409,549	21.84%
-	-	-	-	NA
-	-	-	-	NA
2,512,579	(2,512,579)	-	12,546,476	20.03%
150,378	(150,378)	-	890,708	16.88%
2,206,657	(2,233,252)	(26,595)	11,227,098	19.89%
1,344,155	(1,344,155)	-	5,183,887	25.93%
3,372,935	(3,372,935)	-	16,210,255	20.81%
8,541,268	(8,541,268)	-	30,175,213	28.31%
545,780	(545,780)	-	2,782,496	19.61%
7,511,305	(7,511,305)	-	29,210,227	25.71%
726,609	(726,609)	-	4,542,103	16.00%
6,483,706	(6,483,706)	-	23,136,579	28.02%
3,864,705	(3,864,705)	-	14,022,321	27.56%
198,716	(198,716)	-	1,061,161	18.73%
1,560,704	(1,560,704)	-	6,626,697	23.55%
1,909,829	(1,946,929)	(37,100)	9,798,713	19.87%
1,812,062	(1,812,062)	-	12,044,656	15.04%
4,153,464	(4,153,464)	-	20,202,237	20.56%
1,622,193	(1,622,193)	-	9,225,968	17.58%
1,711,410	(1,711,410)	-	10,367,883	16.51%
3,126,208	(3,126,208)	-	12,101,624	25.83%
967,605	(967,605)	-	4,287,483	22.57%
700,612	(706,278)	(5,666)	3,785,488	18.66%
649,803	(649,803)	-	1,939,960	33.50%
685,927	(685,927)	-	3,075,468	22.30%
3,458,181	(3,458,181)	-	14,294,094	24.19%
6,304,010	(6,304,010)	-	18,938,690	33.29%
673,724	(673,724)	-	2,883,402	23.37%
1,399,358	(1,399,358)	-	7,154,125	19.56%
3,740,468	(3,740,468)	-	17,400,877	21.50%
3,808,963	(3,808,963)	-	21,791,477	17.48%
4,139,155	(4,139,155)	-	18,621,898	22.23%
4,952,939	(4,952,939)	-	20,291,188	24.41%
1,756,208	(1,756,208)	-	12,401,710	14.16%
133,367	(133,367)	-	974,755	13.68%
23,693	(23,693)	-	129,557	18.29%
85,316	(85,316)	-	296,957	29.07%
81,762	(81,762)	-	1,316,791	6.21%
243,247	(743,247)	(500,000)	1,175,508	63.23%
99,462	(99,462)	-	350,319	28.39%
128,920	(128,920)	-	606,983	21.24%
19,234	(19,234)	-	183,717	10.47%
39,179	(39,179)	-	353,375	11.09%
1,067,953	(1,067,953)	-	4,910,870	21.75%
684,179	(684,179)	-	4,506,491	15.18%
65,711	(65,711)	-	272,389	24.12%
523,265	(523,265)	-	2,721,134	19.23%
183,580	(183,580)	-	784,836	23.39%
37,663	(37,663)	-	482,919	7.80%
759,662	(759,662)	-	4,798,208	15.83%
448,563	(448,563)	-	2,606,516	17.21%
458,947	(458,947)	-	2,235,967	20.53%
85,316	(85,316)	-	774,283	11.02%
80,757	(80,757)	-	342,718	23.56%
34,540	(34,540)	-	250,959	13.76%
25,627	(25,627)	-	171,221	14.97%
28,129	(28,129)	-	94,127	29.88%
21,919	(21,919)	-	116,036	18.89%
60,393	(60,393)	-	331,278	18.23%
21,640	(21,640)	-	249,747	8.66%
33,261	(33,261)	-	161,812	20.56%
15,433	(15,433)	-	134,701	11.46%
25,490	(25,490)	-	36,089	70.63%
31,870	(31,870)	-	192,960	16.52%
17,261	(17,261)	-	191,365	9.02%
25,001	(25,001)	-	132,588	18.86%
7,350	(7,350)	-	71,176	10.33%
2,770	(2,770)	-	25,933	10.66%
19,809	(19,809)	-	178,260	11.11%
9,611	(14,453)	(4,842)	80,892	17.87%
6,883	(6,883)	-	174,460	3.95%
289,491	(289,491)	-	3,703,242	7.82%
\$ 92,826,743	\$ (93,400,846)	\$ (574,203)	\$ 415,752,810	22.47%

(Concluded)

NOTE I – Schedule of Employer Allocations

Governmental Accounting Standards Board (GASB) Statement #68 requires employers participating in a cost-sharing pension plan to recognize pension liabilities as employees provide services to the government and earn their pension benefits. For the first time, employers participating in cost-sharing plans are required to recognize their proportionate share of the plan's collective pension amounts for all benefits provided through the plan including the net pension liability, deferred outflows of resources, deferred inflows of resources, pension expense, and contributions.

GASB Statement #68 requires the allocation of the collective pension amounts be consistent with the manner in which contributions to the plan are determined. As permissible under GASB Statement #68, The Schedule of Employer Allocations is used to demonstrate the allocation of Middlesex County Retirement System's collective pension amounts.

Massachusetts General Law (MGL) Chapter 32 Section 22 Paragraph 7c dictates that Massachusetts cost sharing defined benefit pension plans allocate the annual required pension fund appropriation to employer units based on their proportionate share of the aggregate of the annual rates of regular compensation of all members in service of the system. The Public Employee Retirement Administration Commission (PERAC) approves each system's proportionate share of the annual required contribution. PERAC can accept alternative allocation methodologies and as such the System has elected to use an actuarial based allocation methodology. Accordingly, the each member unit's proportionate share of the net pension liability has been calculated based on each member unit's actual current employees, retirees, inactive participants, and actual share of net position as of December 31, 2014.

The County of Middlesex was abolished on July 11, 1997, pursuant to Chapter 48 of the Acts of 1997. This Act required that active employees of Middlesex County and Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2014, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the System's funding schedule. No assets have been allocated to cover the remaining liability and therefore the liability has been allocated to the remaining member units.

The current employees, retirees, beneficiaries and inactive participants of the Middlesex County Retirement System have been identified and their total pension liability has been actuarially determined. For transparency purposes, the System has historically paid a contribution as an employer to itself. However with the implementation of GASB 67 & 68 the net pension liability is allocated to each member unit.

When a member unit accepts an Early Retirement Incentive Program (E.R.I. or ERIP), PERAC completes an analysis of the costs and liabilities attributable to the additional benefits payable in accordance with the ERIP. The accrued liability for the members who accept the ERIP as retirees including the ERIP less the accrued liability for the members as active employees excluding the ERIP represents the increase in accrued liability due to the ERIP. The net increase is amortized for each member unit accepting the ERIP, and is separately identified in the system's funding schedule. The 2002 ERIP amortization is straight line ending in fiscal 2019. The 2003 ERIP amortization is straight line ending in fiscal 2020. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE II – Schedule of Pension Amounts by Employer

The Schedule of Pension Amounts by Employer presents the net pension liability, the various categories of deferred outflows of resources and deferred inflows of resources, covered payroll, pension expense, and contributions for all participating employers including differences between expected and actual economic experience; differences between projected and actual investment earnings, net; and changes of assumptions. Since the system performs an actuarial valuation bi-annually, there are not reported differences between expected and actual experience or a change of assumptions as of December 31, 2014. Additionally, the changes in proportion and differences between employer contributions and proportionate share of contributions are not presented in the initial year of reporting in accordance with GASB Statements 67, 68 and 71.



COMMONWEALTH OF MASSACHUSETTS

Public Employee Retirement Administration Commission

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PERAC

COMMONWEALTH OF MASSACHUSETTS | PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION

PHILIP Y. BROWN, ESQ., *Chairman*

JOHN W. PARSONS, ESQ., *Executive Director*

Auditor SUZANNE M. BUMP | KATHLEEN M. FALLON | KATE FITZPATRICK | JAMES M. MACHADO | RICHARD MACKINNON, JR. | JENNIFER F. SULLIVAN

December 1, 2021

Thomas F. Gibson, Esq., Chairperson
Middlesex County Retirement Board
P.O. Box 160
25 Linnell Circle
Billerica, MA 01865

REFERENCE: Report of the Examination of the Middlesex County Retirement Board for the five-year period from January 1, 2014 through December 31, 2018.

Dear Chairperson Gibson:

The Public Employee Retirement Administration Commission has completed a follow-up review of the finding and recommendation contained in its audit report of the Middlesex County Retirement Board for the period referenced above. We conduct these visits as a regular part of the oversight process to ensure the timely implementation of the recommendation contained in that report. The examination also addressed the other matters discussed at the completion of the audit. The results are as follows:

The Audit Report cited a finding that the board debit card was used for expenses not directly related to board travel.

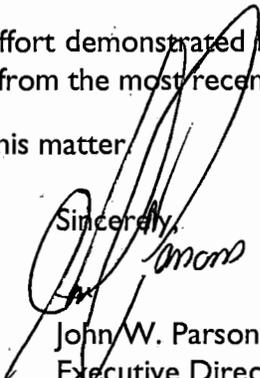
Follow-up Result: The Board has a new PERAC-approved regulation which allows for non-travel use of the debit card. The debit card usage for several months was reviewed for compliance with both this new regulation and 840 CMR 2.11. All charges made were acceptable. This issue is resolved.

The additional matters discussed have been reviewed and have been resolved.

The Commission wishes to acknowledge the effort demonstrated by the staff of the Middlesex County Retirement Board to correct the issue from the most recent examination of the system.

Thank you for your continued cooperation in this matter.

Sincerely,


John W. Parsons, Esq.
Executive Director

JWP/tal

cc: Middlesex County Retirement Board Members

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