

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

	2016	2015
Additions:		
Contributions:		
Member contributions.....	\$ 47,097,081	\$ 45,941,291
Employer contributions.....	107,096,707	99,820,481
Other contributions.....	7,191,133	2,954,865
Total contributions.....	161,384,921	148,716,637
Net investment income (loss):		
Total investment income (loss).....	80,720,725	13,362,645
Less, investment expenses.....	(5,803,179)	(5,545,390)
Net investment income (loss).....	74,917,546	7,817,255
Total additions.....	236,302,467	156,533,892
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.....	162,594	162,594
Total deductions.....	158,365,170	145,611,669
Net increase (decrease) in fiduciary net position.....	77,937,297	10,922,223
Fiduciary net position at beginning of year.....	1,104,482,897	1,093,560,674
Fiduciary net position at end of year.....	\$ 1,182,420,194	\$ 1,104,482,897

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..... 1,104,482,897

Fiduciary net position at end of year..... \$ 1,182,420,194

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><u>1,119,646,946</u></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.....	587,994	141,576	-	729,570
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.....	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.....	(1,764,926)	(135,428)	-	(1,900,354)
Building improvements.....	(353,153)	(27,166)	-	(380,319)
Ford Pick-up truck with plow.....	(19,603)	-	-	(19,603)
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><u>17,708</u></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.

A handwritten signature in cursive script that reads "Bowers & Sullivan LLC".

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	0.084238%
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	0.513438%
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	0.033738%
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	0.000954%
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
<u>Net Pension Liability</u>				
Beginning net pension liability.....	\$ -	\$ -	\$ -	\$ 44,369,446
Ending net pension liability.....	\$ -	\$ -	\$ -	\$ 45,680,759
<u>Deferred Outflows of Resources</u>				
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.....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 4,768,715</u>
<u>Deferred Inflows of Resources</u>				
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.....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 2,216,755</u>
<u>Pension Expense</u>				
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.....	<u>\$ 331,856</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 4,555,290</u>
<u>Contributions</u>				
Statutory required contribution.....	\$ 331,856	\$ -	\$ -	\$ 3,462,510
Contribution in relation to statutory required contribution.....	(331,856)	-	-	(3,462,510)
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
Contributions as a percentage of covered payroll.....	25.13%	0.00%	0.00%	26.59%
<u>Deferred Outflows/(Inflows) Recognized in Future Pension Expense</u>				
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.....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ 2,551,960</u>
<u>Discount Rate Sensitivity</u>				
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.....	122,130	2,033,650	214,679	62,623
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.....	263,980	-	1,198,726	1,309,434
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.....	(29,872)	545,326	(237,881)	(314,827)
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.....	(173,361)	(2,447,482)	(1,429,491)	(3,715,207)
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.....	(29,378)	921,280	10,069	525,653
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.....	2,861,413	905,686	63,150	430,628
Total Deferred Outflows of Resources.....	\$ 17,305,688	\$ 1,908,470	\$ 11,614,506	\$ 1,434,561
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.....	2,084,460	64,434	715,135	-
Total Deferred Inflows of Resources.....	\$ 2,084,460	\$ 64,434	\$ 715,135	\$ -
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.....	87,166	214,879	(205,684)	127,553
Total Employer Pension Expense.....	\$ 16,008,204	\$ 1,320,186	\$ 12,526,666	\$ 1,234,128
Contributions				
Statutory required contribution.....	\$ 9,826,635	\$ 671,055	\$ 8,404,267	\$ 820,032
Contribution in relation to statutory required contribution.....	(9,826,635)	(671,055)	(8,404,267)	(820,032)
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.....	2,881,931	360,910	1,857,582	212,447
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 15,221,228	\$ 1,844,036	\$ 10,899,371	\$ 1,434,561
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.....	<u>\$ 10,073,682</u>	<u>\$ 6,058,249</u>	<u>\$ 310,758</u>	<u>\$ 2,463,453</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.....	2,304,447	139,088	293,604	325,239
Total Deferred Inflows of Resources.....	<u>\$ 2,304,447</u>	<u>\$ 139,088</u>	<u>\$ 293,604</u>	<u>\$ 325,239</u>
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.....	<u>\$ 10,448,122</u>	<u>\$ 6,432,173</u>	<u>\$ 195,958</u>	<u>\$ 2,446,384</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ 7,769,235</u>	<u>\$ 5,919,161</u>	<u>\$ 17,154</u>	<u>\$ 2,138,214</u>
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.....	567,559	1,113,291	176,123	179,315
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.....	1,048,263	58,200	114,625	313,724
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.....	(89,025)	341,256	30,051	(19,793)
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.....	(2,064,334)	(1,836,364)	(4,686,376)	(1,922,136)
Contribution deficiency/(excess).....	<u>\$ (85,414)</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</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.....	184,674	382,595	999,152	345,927
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.....	1,540,528	-	1,952,591	130,400
Total Deferred Outflows of Resources.....	\$ 3,948,612	\$ 4,773,439	\$ 3,614,708	\$ 1,209,510
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.....	-	994,412	136,759	369,567
Total Deferred Inflows of Resources.....	\$ -	\$ 994,412	\$ 136,759	\$ 369,567
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.....	435,791	(269,018)	467,999	(53,712)
Total Employer Pension Expense.....	\$ 3,090,074	\$ 4,992,453	\$ 2,300,052	\$ 1,135,724
Contributions				
Statutory required contribution.....	\$ 1,875,271	\$ 3,499,063	\$ 1,074,825	\$ 874,648
Contribution in relation to statutory required contribution.....	(2,575,271)	(3,499,063)	(1,074,825)	(880,589)
Contribution deficiency/(excess).....	\$ (700,000)	\$ -	\$ -	\$ (5,941)
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.....	627,687	594,695	684,144	98,762
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 3,948,612	\$ 3,779,027	\$ 3,477,949	\$ 839,943
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.....	836,372	2,340,683	138,717	1,682,233
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.....	494	146,747	2,073,934	-
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.....	223,541	571,020	(482,325)	492,616
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.....	(690,007)	(1,530,059)	(4,235,414)	(4,238,879)
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.....	316,217	855,425	425,542	1,075,551
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.....	23,971	117,805	46,456	1,135,948
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.....	-	20,821	39,710	737,955
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.....	6,404	23,420	4,900	113,519
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.....	(27,786)	(87,992)	(99,778)	(699,317)
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.....	9,905	48,853	11,698	76,624
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.....	<u>\$ 191,299</u>	<u>\$ 256,359</u>	<u>\$ 49,908</u>	<u>\$ 121,949</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.....	106,881	149,078	-	4,376
Total Deferred Inflows of Resources.....	<u>\$ 106,881</u>	<u>\$ 149,078</u>	<u>\$ -</u>	<u>\$ 4,376</u>
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.....	<u>\$ 180,249</u>	<u>\$ 241,822</u>	<u>\$ 40,976</u>	<u>\$ 82,413</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ 84,418</u>	<u>\$ 107,281</u>	<u>\$ 49,908</u>	<u>\$ 117,573</u>
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 Vocation Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability.....	\$ 14,784,348	\$ 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.....	<u>\$ 328,068</u>	<u>\$ 114,062</u>	<u>\$ 1,263,501</u>	<u>\$ 1,104,618</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.....	226,151	99,673	209,457	143,320
Total Deferred Inflows of Resources.....	<u>\$ 226,151</u>	<u>\$ 99,673</u>	<u>\$ 209,457</u>	<u>\$ 143,320</u>
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.....	<u>\$ 297,630</u>	<u>\$ 66,824</u>	<u>\$ 1,278,343</u>	<u>\$ 958,296</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ 101,917</u>	<u>\$ 14,389</u>	<u>\$ 1,054,044</u>	<u>\$ 961,298</u>
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.....	108,222	295,530	88,470	98,444
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.....	25,724	67,701	10,329	13,262
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.....	20,161	56,228	19,307	22,490
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.....	(523,099)	(88,372)	(105,697)	(32,430)
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	141,808	92,135	44,855	27,743
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.....	\$ <u>83,767</u>	\$ <u>102,351</u>	\$ <u>49,055</u>	\$ <u>167,216</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.....	8,952	2,793	659	4,162
Total Deferred Inflows of Resources.....	\$ <u>8,952</u>	\$ <u>2,793</u>	\$ <u>659</u>	\$ <u>4,162</u>
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.....	\$ <u>63,560</u>	\$ <u>57,499</u>	\$ <u>39,537</u>	\$ <u>126,571</u>
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.....	\$ <u>74,815</u>	\$ <u>99,558</u>	\$ <u>48,396</u>	\$ <u>163,054</u>
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.....	<u>\$ 50,272</u>	<u>\$ 1,172,627</u>	<u>\$ 35,910</u>	<u>\$ 82,080</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.....	53,408	84,855	6,549	9,770
Total Deferred Inflows of Resources.....	<u>\$ 53,408</u>	<u>\$ 84,855</u>	<u>\$ 6,549</u>	<u>\$ 9,770</u>
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.....	<u>\$ 6,799</u>	<u>\$ 433,942</u>	<u>\$ 27,516</u>	<u>\$ 56,481</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ (3,136)</u>	<u>\$ 1,087,772</u>	<u>\$ 29,361</u>	<u>\$ 72,310</u>
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.....	<u>\$ 5,341</u>	<u>\$ 52,736</u>	<u>\$ 56,186</u>	<u>\$ 14,911</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.....	-	3,087	178	9,808
Total Deferred Inflows of Resources.....	<u>\$ -</u>	<u>\$ 3,087</u>	<u>\$ 178</u>	<u>\$ 9,808</u>
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.....	<u>\$ 2,718</u>	<u>\$ 48,105</u>	<u>\$ 26,895</u>	<u>\$ 3,194</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ 5,341</u>	<u>\$ 49,649</u>	<u>\$ 56,008</u>	<u>\$ 5,103</u>
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
<u>Net Pension Liability</u>		
Beginning net pension liability.....	\$ 4,808,243	\$ 1,290,018,945
Ending net pension liability.....	\$ 4,668,086	\$ 1,416,876,555
<u>Deferred Outflows of Resources</u>		
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.....	<u>175,100</u>	<u>25,140,901</u>
Total Deferred Outflows of Resources.....	<u>\$ 644,280</u>	<u>\$ 167,548,388</u>
<u>Deferred Inflows of Resources</u>		
Differences between expected and actual experience.....	\$ -	\$ -
Changes of assumptions.....	-	-
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>423,718</u>	<u>25,140,901</u>
Total Deferred Inflows of Resources.....	<u>\$ 423,718</u>	<u>\$ 25,140,901</u>
<u>Pension Expense</u>		
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.....	<u>(52,513)</u>	<u>-</u>
Total Employer Pension Expense.....	<u>\$ 464,637</u>	<u>\$ 157,298,862</u>
<u>Contributions</u>		
Statutory required contribution.....	\$ 425,887	\$ 105,246,798
Contribution in relation to statutory required contribution.....	<u>(425,887)</u>	<u>(107,067,707)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ (1,820,909)</u>
Contributions as a percentage of covered payroll.....	11.41%	23.94%
<u>Deferred Outflows/(Inflows) Recognized in</u>		
<u>Future Pension Expense</u>		
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.....	<u>(14,211)</u>	<u>23,331,317</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 220,562</u>	<u>\$ 142,407,487</u>
<u>Discount Rate Sensitivity</u>		
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.