

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2017

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Financial Section



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Independent Auditor's Report

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

Report on the Financial Statements

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

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

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

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

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

Opinion

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

Other Matters

Required Supplementary Information

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

Other Reporting Required by Government Auditing Standards

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

Restriction on Use

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



August 7, 2018

Management's Discussion and Analysis

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

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

Financial Highlights

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

Overview of the Financial Statements

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

Fiduciary Financial Statements

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

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

Notes to the financial statements

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

Required Supplementary Information

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

Financial Analysis

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

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

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

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

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

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

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

Requests for Information

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

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2017

Assets

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

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2017

Additions:

Contributions:

Employer pension appropriation.....	\$	115,377,205
Member contributions.....		44,177,815
Transfers from other systems.....		5,727,459
3(8)(c) contributions from other systems.....		3,572,503
Workers' compensation settlements.....		58,300
Federal grant reimbursements.....		26,530
Members' makeup payments and redeposits.....		820,577
Interest not refunded.....		112,658
Reimbursement of 91A overearnings.....		87,746

Total contributions..... 169,960,793

Net investment income:

Investment income (loss).....	195,709,657
Less: investment expense.....	(6,366,083)

Net investment income (loss)..... 189,343,574

Total additions..... 359,304,367

Deductions:

Administration.....	2,619,464
Building operations and maintenance.....	306,177
Retirement benefits and refunds.....	144,622,539
Transfers to other systems.....	5,051,691
3(8)(c) transfer to other systems.....	10,464,963
Depreciation.....	308,508

Total deductions..... 163,373,342

Net increase (decrease) in fiduciary net position..... 195,931,025

Fiduciary net position at beginning of year..... 1,182,420,194

Fiduciary net position at end of year..... \$ 1,378,351,219

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

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

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

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

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

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

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

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

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

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

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

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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

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

Cash and Investments

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

Fair Value Measurements

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

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

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

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

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

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

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

Accounts Receivable

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

Deferred Outflows/Inflows of Resources

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

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

NOTE 3 – PLAN ADMINISTRATION

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

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

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

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

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

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

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

NOTE 4 – OFFICE BUILDING

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

NOTE 5 – CASH AND INVESTMENTS

Custodial Credit Risk - Deposits

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

Investments

The System’s investments are as follows:

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

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

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

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

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

Fair Market Value of Investments

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

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

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

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

Mone

y 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
Pick-up truck.....	5
PTG Software.....	5

Capital asset activity for the year ended December 31, 2017, 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.....	729,570	-	(729,570)	-
Total capital assets not being depreciated.	<u>1,402,227</u>	<u>-</u>	<u>(729,570)</u>	<u>672,657</u>
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,086,623	6,250	-	1,092,873
Vehicles.....	19,603	30,913	-	50,516
PTG Software.....	-	729,570	-	729,570
Total capital assets being depreciated.....	<u>6,523,362</u>	<u>766,733</u>	<u>-</u>	<u>7,290,095</u>
<u>Less accumulated depreciation for:</u>				
Buildings.....	(1,900,354)	(135,428)	-	(2,035,782)
Building improvements.....	(380,319)	(27,166)	-	(407,485)
Vehicles.....	(19,603)	-	-	(19,603)
PTG Software.....	-	(145,914)	-	(145,914)
Total accumulated depreciation.....	<u>(2,300,276)</u>	<u>(308,508)</u>	<u>-</u>	<u>(2,608,784)</u>
Total capital assets being depreciated, net.....	<u>4,223,086</u>	<u>458,225</u>	<u>-</u>	<u>4,681,311</u>
Total capital assets, net.....	<u>\$ 5,625,313</u>	<u>\$ 458,225</u>	<u>\$ (729,570)</u>	<u>\$ 5,353,968</u>

NOTE 7 – MEMBERSHIP

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

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

NOTE 8 – ACTUARIAL VALUATION

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

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

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

Valuation date.....	January 1, 2018
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.5% for fiscal 2018 through fiscal 2024, and thereafter the remaining unfunded liability will be amortized on a 4.0% annual increasing basis; ERI liability amortized in level payments.
Remaining amortization period.....	As of July 1, 2018, 1 year remaining for 2002 ERI liability, 2 years remaining for 2003 ERI liability, 4 years remaining for 2010 ERI liability, and 17 years for remaining unfunded liability.
Asset valuation method.....	The difference between the expected return and the actual investment return on a market value basis is recognized over a five year period. Asset value is adjusted as necessary to be within 20% of the market value.
Inflation rate.....	3.25% (previously 3.5%)

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

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

The long-term expected rate of return on pension plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic real rates of return for each major asset class included in the pension plan’s target asset allocation as of January 1, 2018, are summarized in the following table:

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

Discount rate: The discount rate used to measure the total pension liability was 7.50%. The projection of cash flows used to determine the discount rate assumed plan member contributions will be made at the current contribution rate and that contributions will be made at rates equal to the actuarially determined contribution rate. Based on those assumptions, the pension plan’s fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

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

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

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

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

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

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

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

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

NOTE 10 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

During 2017, the following GASB pronouncements were implemented:

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

The following GASB pronouncements will be implemented in the future:

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

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

NOTE 11 – SUBSEQUENT EVENTS

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

Required Supplementary Information

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

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

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

See notes to required supplementary information.

SCHEDULE OF CONTRIBUTIONS

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

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

See notes to required supplementary information.

SCHEDULE OF INVESTMENT RETURNS

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

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

See notes to required supplementary information.

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

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

NOTE B – CONTRIBUTIONS

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

NOTE C – MONEY WEIGHTED RATE OF RETURN

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

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONSChanges in Assumptions

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

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

Changes in Plan Provisions

None.

Audit of Specific Elements, Accounts and Items of Financial Statements

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Independent Auditor's Report

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

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

Management's Responsibility for the Schedules

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

Auditor's Responsibility

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

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

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

Opinions

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

Other Matter

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

Restriction on Use

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

A handwritten signature in black ink that reads "Bowers & Sullivan LLC". The signature is written in a cursive, flowing style.

August 7, 2018

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2017

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	48,182,609	3.395091%
Town of Ashby.....	1,780,532	0.125462%
Town of Ashland.....	32,308,841	2.276578%
Town of Ayer.....	17,999,043	1.268266%
Town of Bedford.....	49,661,979	3.499331%
Town of Billerica.....	140,303,356	9.886194%
Town of Boxborough.....	10,225,882	0.720546%
Town of Burlington.....	117,368,093	8.270107%
Town of Carlisle.....	9,435,767	0.664872%
Town of Chelmsford.....	103,993,778	7.327712%
Town of Dracut.....	60,106,114	4.235256%
Town of Dunstable.....	2,563,856	0.180657%
Town of Groton.....	21,402,700	1.508098%
Town of Holliston.....	23,773,972	1.675185%
Town of Hopkinton.....	20,653,839	1.455331%
Town of Hudson.....	63,161,014	4.450514%
Town of Lincoln.....	24,841,810	1.750428%
Town of Littleton.....	21,432,789	1.510218%
Town of North Reading.....	48,035,495	3.384725%
Town of Pepperell.....	16,341,195	1.151449%
Town of Sherborn.....	10,500,304	0.739883%
Town of Shirley.....	8,406,745	0.592364%
Town of Stow.....	10,459,477	0.737006%
Town of Sudbury.....	58,772,716	4.141301%
Town of Tewksbury.....	98,006,180	6.905808%
Town of Townsend.....	8,090,096	0.570052%
Town of Tyngsborough.....	20,897,452	1.472497%
Town of Wayland.....	53,697,606	3.783694%
Town of Westford.....	51,698,881	3.642858%
Town of Weston.....	61,375,790	4.324722%
Town of Wilmington.....	83,422,615	5.878207%
Acton-Boxborough Regional School District.....	27,084,083	1.908425%
Acton Water Supply.....	3,370,594	0.237502%
Bedford Housing Authority.....	313,455	0.022087%
Billerica Housing Authority.....	1,359,538	0.095797%
Chelmsford Housing Authority.....	2,029,608	0.143012%
Chelmsford Water District.....	391,160	0.027562%
Dracut Housing Authority.....	2,055,364	0.144827%
Dracut Water Supply.....	3,031,987	0.213643%
East Chelmsford Water District.....	317,151	0.022347%
East Middlesex Mosquito Control.....	509,331	0.035889%
Greater Lowell Regional Vocational Technical School District.....	15,614,520	1.100246%
Groton-Dunstable Regional School District.....	10,714,454	0.754972%
Hudson Housing Authority.....	1,155,540	0.081423%
Lincoln-Sudbury Regional School District.....	8,466,429	0.596570%
Nashoba Valley Technical High School District.....	3,512,891	0.247529%
North Chelmsford Water District.....	814,336	0.057381%
North Middlesex Regional School District.....	11,610,214	0.818090%
Shawsheen Valley Regional Vocational School.....	7,940,619	0.559520%
South Middlesex Regional Vocational Technical School.....	6,492,906	0.457510%
Sudbury Water District.....	1,701,694	0.119906%
Tewksbury Housing Authority.....	1,527,710	0.107647%
Wayland Housing Authority.....	611,202	0.043067%
Hopkinton Housing Authority.....	458,176	0.032284%
Sudbury Housing Authority.....	436,617	0.030765%
Wilmington Housing Authority.....	335,690	0.023654%
Acton Housing Authority.....	741,792	0.052269%
Burlington Housing Authority.....	56,771	0.004000%
Ayer Housing Authority.....	792,328	0.055830%
Holliston Housing Authority.....	142,446	0.010037%
Littleton Housing Authority.....	465,317	0.032788%
Westford Housing Authority.....	517,839	0.036488%
Shirley Water District.....	335,341	0.023629%
Tyngsborough Housing Authority.....	496,440	0.034981%
Pepperell Housing Authority.....	175,037	0.012334%
Groton Housing Authority.....	(15,094)	-0.001064%
Tyngsborough Water District.....	380,399	0.026804%
North Reading Housing Authority.....	139,940	0.009861%
West Groton Water.....	21,871	0.001541%
Ayer-Shirley Regional School District.....	4,178,529	0.294432%
Total.....	\$ 1,419,184,751	100.000%

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, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability.....	\$ 8,912,285	\$ 10,493,658	\$ 56,372,784	\$ 93,491,923
Ending net pension liability.....	\$ 8,406,745	\$ 10,459,477	\$ 58,772,716	\$ 98,006,180
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 28,350	\$ 35,272	\$ 198,197	\$ 330,503
Changes of assumptions.....	803,584	999,801	5,617,969	9,368,220
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	111,480	214,065	1,658,187	3,136,289
Total Deferred Outflows of Resources.....	\$ 943,414	\$ 1,249,138	\$ 7,474,353	\$ 12,835,012
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 42,932	\$ 53,415	\$ 300,141	\$ 500,499
Net difference between projected and actual investment earnings on pension plan investments.....	228,343	284,099	1,596,376	2,662,030
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	971,642	83,267	1,190,337	1,135,255
Total Deferred Inflows of Resources.....	\$ 1,242,917	\$ 420,781	\$ 3,086,854	\$ 4,297,784
Pension Expense				
Proportionate share of plan pension expense.....	\$ 978,288	\$ 1,217,159	\$ 6,839,316	\$ 11,404,870
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(263,016)	52,745	14,881	327,598
Total Employer Pension Expense.....	\$ 715,272	\$ 1,269,904	\$ 6,854,197	\$ 11,732,468
Contributions				
Statutory required contribution.....	\$ 755,576	\$ 826,612	\$ 4,185,908	\$ 7,504,649
Contribution in relation to statutory required contribution.....	(755,576)	(826,612)	(4,191,182)	(7,504,649)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (5,274)	\$ -
Contributions as a percentage of covered payroll.....	44.61%	23.12%	26.41%	34.43%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2019.....	\$ (37,339)	\$ 333,528	\$ 1,592,623	\$ 2,958,555
June 30, 2020.....	(43,346)	326,052	1,550,621	2,888,515
June 30, 2021.....	(128,741)	196,539	1,024,670	2,128,701
June 30, 2022.....	(90,077)	(27,762)	219,585	561,457
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (299,503)	\$ 828,357	\$ 4,387,499	\$ 8,537,228
Discount Rate Sensitivity				
1% decrease (6.50%).....	\$ 10,317,869	\$ 12,837,261	\$ 72,133,689	\$ 120,286,211
Current discount rate (7.50%).....	\$ 8,406,745	\$ 10,459,477	\$ 58,772,716	\$ 98,006,180
1% increase (8.50%).....	\$ 6,795,403	\$ 8,454,688	\$ 47,507,631	\$ 79,221,138
Covered Payroll.....	\$ 1,693,751	\$ 3,575,149	\$ 15,869,459	\$ 21,795,849

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2017

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

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

(Concluded)

NOTE I – Schedule of Employer Allocations

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

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

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

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

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

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

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

NOTE II – Schedule of Pension Amounts by Employer

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

Changes in Assumptions

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

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

Changes in Plan Provisions

None.