

MIDDLESEX COUNTY RETIREMENT SYSTEM AUDIT REPORT

JAN. 1, 2019 - DEC. 31, 2023



PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

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PERAC

COMMONWEALTH OF MASSACHUSETTS | PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION

PHILIP Y. BROWN, ESQ., *Chair*

WILLIAM T. KEEFE, *Executive Director*

Auditor DIANA DIZOGLIO | KATHLEEN M. FALLON | KATE FITZPATRICK | JAMES J. GUIDO | RICHARD MACKINNON, JR. | JENNIFER F. SULLIVAN, ESQ.

December 4, 2025

The Public Employee Retirement Administration Commission (PERAC) has completed a review of the audits of the Middlesex County Retirement System conducted by the firm of Powers & Sullivan, LLC, Certified Public Accountants. Powers & Sullivan conducted these audits in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits in *Government Auditing Standards*, issued by the Comptroller General of the United States. The audits covered the period from January 1, 2019 to December 31, 2023.

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

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

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

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



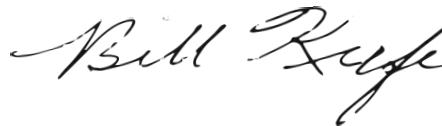
In our opinion, the financial records are being maintained and the management functions are being performed in conformity with the standards established by PERAC with the exception of those related to our supplemental work which are detailed in the finding presented in this report.

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

The financial statements and footnotes presented in this report were limited to the express results as of and for the years ended December 31, 2023, December 31, 2022, December 31, 2021, December 31, 2020, and December 31, 2019.

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

Sincerely,

A handwritten signature in black ink that reads "Bill Keefe". The signature is written in a cursive style with a large, stylized initial "B".

William T. Keefe
Executive Director

EXPLANATION OF FINDING AND RECOMMENDATION

Regular Compensation:

We tested retirement deductions from payrolls of 34 employing units in the Middlesex County System. We found instances of pay types that should have been regular compensation which were not subject to deductions and instances of pay types that are not regular compensation that were subject to deductions.

Pay types that were incorrectly not considered regular compensation included night shift differentials, on-call pay when the work was required and scheduled, and a police department stipend covering photography and fingerprinting. Pay types that were incorrectly considered regular compensation included a uniform stipend and intermittent summer school pay.

Additionally, our review of retiree calculations found two retirees with errors related to regular compensation. One superannuation retiree had retirement deductions taken on health care reimbursements. Although this error was discovered by the Board and the deductions were returned to the member, the salary used in the allowance calculation was not lowered to exclude this pay. One accidental disability retiree had retroactive pay included in the regular compensation total used for the allowance calculation which was outside of the final year of payroll. Pursuant to 840 CMR 15.03 3(e) this pay should have been allocated to the effective dates it covered rather than the date of receipt.

Recommendation: The Board should work with the payroll departments to determine which pays are subject to retirement and begin taking retirement deductions. Deductions taken on pays that are not considered regular compensation should be refunded to the members.

The retirees cited should be recalculated. When calculating the amount owed to the Board, interest should be applied at the Board's correction of errors rate.

Board Response:

The Board conducts multiple training sessions annually for the payroll specialists of the System's 74 governmental units, which include substantive reviews and updates of ever-evolving regular compensation determinations. In the cases cited by PERAC, refunds and recalculations are being processed and will be completed by the time of PERAC's scheduled follow-up review.

FINAL DETERMINATION:

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

SUPPLEMENTARY INFORMATION

SCHEDULE OF ALLOCATION OF INVESTMENTS OWNED

(percentages by category)

AS OF DECEMBER 31, 2023		
	MARKET VALUE	PERCENTAGE OF TOTAL ASSETS
Cash	\$81,767,823	3.9%
Pooled Alternative Investment Funds	495,358	0.0%
PRIT Core Fund	<u>1,990,183,151</u>	<u>96.0%</u>
Grand Total	<u>\$2,072,446,332</u>	<u>100.0%</u>

For the year ending December 31, 2023, the rate of return for the investments of the Middlesex County Retirement System was 11.19%. For the ten-year period ending December 31, 2023, the rate of return for the investments of the Middlesex County Retirement System averaged 7.62%. For the 39-year period ending December 31, 2023, since PERAC began evaluating the returns of the retirement systems, the rate of return on the investments of the Middlesex County Retirement System was 8.35%.

The composite rate of return for all retirement systems for the year ending December 31, 2023 was 11.64%. For the ten-year period ending December 31, 2023, the composite rate of return for the investments of all retirement systems averaged 7.81%. For the 39-year period ending December 31, 2023, since PERAC began evaluating the returns of the retirement systems, the composite rate of return on the investments of all retirement systems averaged 9.05%.

SUPPLEMENTARY INFORMATION (Continued)

ADMINISTRATION OF THE SYSTEM

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

Ex-officio Member:	Thomas F. Gibson, Esq., Chairperson	Term Expires:	12/31/2026
Appointed Member:	Brian P. Curtin	Term Expires:	12/31/2027
Elected Member:	Joseph W. Kearns	Term Expires:	12/31/2025
Elected Member:	John Brown, Jr.	Term Expires:	12/31/2026
Fifth Member:	Robert W. Healy	Term Expires:	12/16/2025

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

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

Retirement board members and employees are bonded by an authorized agent representing a company licensed to do business in Massachusetts. Fidelity insurance is the only required policy coverage under Ch. 32 §21 and §23 as well as 840 CMR 17.01. The policy is designed to cover specific intentional acts such as theft, fraud or embezzlement and also specify who commits such acts, most commonly employees of the system. This coverage reimburses the system for the losses it suffers as a result of its employees' actions. It does not insure the employees for their illegal acts. Statutorily required coverage is provided by the current fidelity insurance policy to a limit of \$1,000,000 with a \$10,000 deductible issued through Travelers Casualty and Surety Insurance Company of America. The system also has Fiduciary coverage to a limit of \$100,000,000 under a blanket policy issued through the Massachusetts Association of Contributory Retirement Systems.

BOARD REGULATIONS

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

SUPPLEMENTARY INFORMATION (Continued)

MEMBERSHIP EXHIBIT

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Retirement in Past Years										
Superannuation	295	289	268	294	327	315	374	398	329	356
Ordinary Disability	1	0	1	2	1	2	0	0	1	3
Accidental Disability	12	6	8	6	5	15	14	8	10	12
Total Retirements	308	295	277	302	333	332	388	406	340	371
Total Retirees, Beneficiaries and Survivors	5,267	5,288	5,394	5,497	5,677	5,949	6,156	6,388	6,503	6,719
Total Active Members	10,224	10,306	9,997	9,283	9,142	9,257	9,285	9,403	9,446	9,536
Pension Payments										
Superannuation	\$75,978,373	\$86,762,912	\$90,372,428	\$94,423,315	\$99,461,542	\$105,946,729	\$110,204,578	\$117,639,143	\$125,887,591	\$135,608,881
Survivor/Beneficiary Payments	4,154,980	2,020,209	5,023,927	4,946,105	5,119,154	5,570,318	5,801,485	6,239,961	6,668,627	7,123,741
Ordinary Disability	1,377,095	1,381,443	1,072,875	1,110,977	1,130,516	1,060,806	1,005,333	902,490	794,035	838,378
Accidental Disability	13,934,194	14,790,305	12,858,584	13,247,123	13,409,632	14,126,886	14,480,046	14,737,549	15,040,982	15,654,157
Other	<u>10,116,822</u>	<u>10,251,686</u>	<u>14,857,779</u>	<u>13,941,224</u>	<u>16,220,421</u>	<u>14,862,219</u>	<u>18,288,311</u>	<u>14,225,013</u>	<u>14,764,395</u>	<u>19,741,147</u>
Total Payments for Year	<u>\$105,561,463</u>	<u>\$115,206,556</u>	<u>\$124,185,592</u>	<u>\$127,668,745</u>	<u>\$135,341,266</u>	<u>\$141,566,957</u>	<u>\$149,779,752</u>	<u>\$153,744,156</u>	<u>\$163,155,631</u>	<u>\$178,966,303</u>



**Powers &
Sullivan, LLC**
CPAs AND ADVISORS

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2023

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2023

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Financial Section

Middlesex County Retirement System

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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

Opinion

We have audited the accompanying financial statements of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2023, and the related notes to the financial statements, which collectively comprise the MCRS's financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the MCRS as of December 31, 2023, and the changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

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. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the MCRS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management's 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, and for 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.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the MCRS's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a

guarantee that an audit conducted in accordance with generally accepted auditing standards will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform auditing procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit 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 MCRS's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgement, there are conditions or events, considered in the aggregate, that raise substantial doubt about the MCRS's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that 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 is the responsibility of management and, 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 14, 2024 on our consideration of the MCRS'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 solely 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 effectiveness of MCRS's 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 MCRS's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of MCRS, 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.

A handwritten signature in black ink, appearing to read "Powers & Sullivan LLC". The signature is written in a cursive, flowing style.

August 14, 2024

Management's Discussion and Analysis

As management of the Middlesex County Retirement System (MCRS), we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2023. The MCRS 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 MCRS's assets exceeded its liabilities at the close of the most recent year by \$2.1 billion (net position).
- The MCRS's net position increased by \$200.3 million for the year ended December 31, 2023.
- Total investment income was \$206.0 million; investment expenses were \$9.7 million; and net investment income was \$196.3 million.
- Total contributions were \$241.1 million, primarily consisting of \$167.1 million from employers, \$57.3 million from members, \$8.7 million in transfers from other systems and \$8.0 million in other contributions.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$233.7 million.
- Depreciation, administrative and building expenses were \$3.4 million.
- The total pension liability was \$3.8 billion as of December 31, 2023, while the net pension liability was \$1.7 billion.
- The Plan fiduciary net position as a percentage of the total pension liability was 55.21%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the MCRS's 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 fiduciary 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 MCRS'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 MCRS's financial position. The MCRS's assets exceeded liabilities by \$2.1 billion at the close of 2023.

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 MCRS's net position included investments of \$2.0 billion, cash of \$81.8 million and current accounts receivable of \$7.7 million. The system also had capital assets, net of accumulated depreciation, of \$4.0 million at year-end primarily consisting of land, an office building, and building improvements.

In 2023, the MCRS's contributions were \$241.1 million while deductions were \$237.1 million which resulted in a current surplus of \$4.0 million. In 2022, the MCRS's contributions were \$229.4 million while deductions were \$215.2 million which resulted in a prior year surplus of \$14.2 million. Therefore, for these two years the MCRS 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. The System experienced a net investment income of \$196.3 million in 2023, compared to a loss of \$240.2 million in 2022. The annual money weighted rate of return was 10.95% and -11.54% in 2023, and 2022, respectively. The MCRS's investment policy is designed to achieve a long-term rate of return of 7.15% and fluctuation in annual investment returns is expected.

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

	2023	2022
Assets:		
Cash.....	\$ 81,767,823	\$ 31,868,459
Investments.....	1,990,678,509	1,842,477,278
Receivables.....	7,709,459	5,531,048
Capital assets, net of accumulated depreciation....	4,026,260	4,044,658
Total assets.....	2,084,182,051	1,883,921,443
Liabilities:		
Accounts payable.....	122,943	127,569
Other liabilities.....	26,556	26,556
Total liabilities.....	149,499	154,125
Net Position Restricted for Pensions.....	\$ 2,084,032,552	\$ 1,883,767,318

	<u>2023</u>	<u>2022</u>
Additions:		
Contributions:		
Member contributions.....	\$ 57,300,892	\$ 54,257,364
Employer contributions.....	167,210,111	156,421,867
Other contributions.....	<u>16,584,815</u>	<u>18,734,375</u>
Total contributions.....	<u>241,095,818</u>	<u>229,413,606</u>
Net investment income (loss):		
Total investment income (loss).....	205,958,860	(230,563,506)
Less, investment expenses.....	<u>(9,666,276)</u>	<u>(9,685,400)</u>
Net investment income (loss).....	<u>196,292,584</u>	<u>(240,248,906)</u>
Total additions.....	<u>437,388,402</u>	<u>(10,835,300)</u>
Deductions:		
Administration.....	3,122,473	3,024,829
Building operations and maintenance.....	117,205	196,641
Retirement benefits, refunds and transfers.....	233,709,115	211,772,537
Depreciation.....	<u>174,375</u>	<u>174,374</u>
Total deductions.....	<u>237,123,168</u>	<u>215,168,381</u>
Net increase (decrease) in fiduciary net position....	200,265,234	(226,003,681)
Fiduciary net position at beginning of year.....	<u>1,883,767,318</u>	<u>2,109,770,999</u>
Fiduciary net position at end of year.....	\$ <u>2,084,032,552</u>	\$ <u>1,883,767,318</u>

Requests for Information

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

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2023

Assets	
Cash and cash equivalents.....	\$ 81,767,823
Investments:	
Investments in Pension Reserve Investment Trust.....	1,990,183,151
Pooled alternative investments.....	<u>495,358</u>
Total investments.....	<u>1,990,678,509</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	4,374,986
Employer pension appropriation.....	1,584,664
Reimbursements from other systems.....	863,243
Member make-up payments and redeposits.....	335,089
Transfers from other systems.....	572,916
Other accounts receivable.....	<u>38,561</u>
Total receivables.....	<u>7,769,459</u>
Capital assets, net of accumulated depreciation.....	<u>4,026,260</u>
Total Assets.....	<u>2,084,242,051</u>
Liabilities	
Accounts payable.....	122,943
Other liabilities.....	<u>26,556</u>
Total Liabilities.....	<u>149,499</u>
Net Position Restricted for Pensions.....	\$ <u>2,084,092,552</u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2023

Additions:	
Contributions:	
Employer pension appropriation.....	\$ 167,196,611
Member contributions.....	57,300,892
Transfers from other systems.....	8,708,163
3(8)(c) contributions from other systems.....	6,125,792
Workers' compensation settlements.....	73,500
Retirement benefits - state COLA reimbursements.....	560,618
Members' makeup payments and redeposits.....	949,776
Interest not refunded.....	<u>240,466</u>
 Total contributions.....	 <u>241,155,818</u>
Net investment income (loss):	
Investment income (loss).....	205,958,860
Less: investment expense.....	<u>(9,666,276)</u>
 Net investment income (loss).....	 <u>196,292,584</u>
 Total additions.....	 <u>437,448,402</u>
Deductions:	
Administration.....	3,122,473
Building operations and maintenance.....	117,205
Retirement benefits and refunds.....	211,786,865
Transfers to other systems.....	10,301,479
3(8)(c) transfer to other systems.....	11,620,771
Depreciation.....	<u>174,375</u>
 Total deductions.....	 <u>237,123,168</u>
 Net increase (decrease) in fiduciary net position.....	 200,325,234
 Fiduciary net position at beginning of year.....	 <u>1,883,767,318</u>
 Fiduciary net position at end of year.....	 <u>\$ 2,084,092,552</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System (MCRS) is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week and who are paid annual compensation of no less than \$5,000. As of January 1, 2024, the MCRS had 71 participating employers.

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

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

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

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

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

Administrative expenses are paid from investment income.

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

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

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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

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

Cash and Investments

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

Fair Value Measurements

The MCRS 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 MCRS'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 MCRS 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:	12/31/2026
Advisory Council Member.....	Brian P. Curtin	Term Expires:	12/31/2024
Elected Member.....	John Brown	Term Expires:	12/31/2026
Elected Member.....	Joseph W. Kearns	Term Expires:	12/31/2025
Appointed Member.....	Robert W. Healy, Jr.	Term Expires:	12/16/2025

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 MCRS. The Board must annually file a financial statement of condition

for the MCRS with the Executive Director of PERAC.

The investment of the MCRS'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 MCRS has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the MCRS 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
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, 2023, the carrying amount of the MCRS's deposits totaled \$81,767,823, and the bank balance totaled \$84,993,362, all of which was covered by Federal Depository Insurance.

Investments

The MCRS's investments were as follows:

<u>Investment Type</u>	<u>December 31, 2023</u>
PRIT Pooled Funds.....	\$ 1,990,183,151
Pooled Alternative Investments...	495,358
Total Investments.....	<u>\$ 1,990,678,509</u>

Approximately 99.8% of the Retirement MCRS'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. The effective weighted duration rate for PRIT investments ranged from 1.98 to 14.64 years.

Approximately 0.01% of the MCRS's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 0.01% of the MCRS'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 10.95%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Value of Investments

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

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

The MCRS had the following recurring fair value measurements as of December 31, 2023:

Investment Type	12/31/2023	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:				
Pooled Alternative Investments	\$ 495,358	\$ -	\$ -	\$ 495,358
Investments measured at the net asset value (NAV):				
PRIT Investments	1,990,183,151			
Total Investments	\$ 1,990,678,509			

Money market mutual funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled alternative investments and pooled real estate funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method.

NOTE 6 – CAPITAL ASSETS

All purchases and building costs in excess of \$25,000 are capitalized at the date of acquisition. Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements.....	40
Vehicles.....	5
Software and equipment.....	5

Capital asset activity for the year ended December 31, 2023, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
Construction in progress.....	9,375	155,977	-	165,352
Total capital assets not being depreciated.	682,032	155,977	-	838,009
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,200,242	-	-	1,200,242
Software and equipment.....	27,619	-	-	27,619
Total capital assets being depreciated.....	6,644,997	-	-	6,644,997
<u>Less accumulated depreciation for:</u>				
Buildings.....	(2,712,922)	(135,428)	-	(2,848,350)
Building improvements.....	(551,037)	(29,740)	-	(580,777)
Software and equipment.....	(18,412)	(9,207)	-	(27,619)
Total accumulated depreciation.....	(3,282,371)	(174,375)	-	(3,456,746)
Total capital assets being depreciated, net.....	3,362,626	(174,375)	-	3,188,251
Total capital assets, net.....	\$ 4,044,658	\$ (18,398)	\$ -	\$ 4,026,260

NOTE 7 – MEMBERSHIP

The following table represents the MCRS's membership at January 1, 2023:

Active members.....	9,603
Inactive participants entitled to a refund of employee contributions.....	4,227
Inactive participants with a vested right to a deferred or immediate benefit....	470
Retired participants or beneficiaries currently receiving benefits.....	<u>6,607</u>
Total.....	<u>20,907</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2023, were as follows:

Total pension liability.....	\$ 3,775,150,350
The MCRS's fiduciary net position.....	<u>2,084,092,552</u>
The net pension liability.....	\$ <u>1,691,057,798</u>
The MCRS's fiduciary net position as a percentage of the total pension liability.....	55.21%

The total pension liability was determined by an actuarial valuation as of January 1, 2024, using the following actuarial assumptions, applied to all periods included in the measurement that was rolled back to December 31, 2023:

Valuation date.....	January 1, 2024.
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.50% for fiscal 2023, through fiscal 2028, and thereafter the remaining unfunded liability will be amortized on a 4.00% annual increasing basis;
Remaining amortization period.....	14 years from July 1, 2022.
Asset valuation method.....	The difference between the expected return and the actual investment return on a fair value basis is recognized over a five year period. Asset value is adjusted as necessary to be within 20% of the fair value.
Investment rate of return/Discount rate..	7.15%.
Inflation rate.....	3.25%.
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.....	5.00% of the first \$16,000 for fiscal 2023 and 3.00% of the first \$16,000 thereafter.
Mortality Rates:	
Pre-Retirement.....	The RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2021.
Healthy Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2021.
Disabled Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year and projected generationally with Scale MP-2021.

Investment policy: The MCRS'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 MCRS's target asset allocation as of December 31, 2023, are summarized in the following table:

Asset Class	Long-Term Expected Asset Allocation	Long-Term Expected Real Rate of Return
Domestic equity.....	22.00%	6.29%
International developed markets equity.....	9.50%	6.39%
International emerging markets equity.....	4.50%	7.63%
Core fixed income.....	15.00%	1.72%
High-yield fixed income.....	9.00%	3.43%
Real estate.....	10.00%	3.24%
Timber.....	4.00%	3.72%
Hedge funds, GTAA, risk parity.....	10.00%	2.87%
Private equity.....	16.00%	9.43%
	100.00%	

Discount rate: The discount rate used to measure the total pension liability was 7.15% at December 31, 2023, and December 31, 2022. 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 MCRS's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the discount rate: The following presents the net pension liability, calculated using the discount rate of 7.15%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.15%) or 1-percentage-point higher (8.15%) than the current rate:

	1% Decrease (6.15%)	Current Discount (7.15%)	1% Increase (8.15%)
Middlesex County Retirement System's net pension liability as of December 31, 2023.....	\$ 2,117,083,698	\$ 1,691,057,798	\$ 1,332,542,696

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 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

There were no GASB pronouncements required to be implemented in 2023 that impacted the MCRS's financial statements.

None of the issued GASB statements that are required to be implemented in future years are anticipated to impact the MCRS's financial statements.

NOTE 10 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through August 14, 2024 which is the date the financial statements were available to be issued.

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Required Supplementary Information

Middlesex County Retirement System

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Required Supplementary Information

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

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

See notes to required supplementary information.

December 31, 2018	December 31, 2019	December 31, 2020	December 31, 2021	December 31, 2022	December 31, 2023
\$ 64,615,910	\$ 66,816,001	\$ 73,591,385	\$ 76,097,081	\$ 78,883,633	\$ 81,569,522
208,614,148	216,905,943	229,825,239	238,805,957	245,416,378	254,059,307
-	29,156,339	-	-	-	18,729,653
-	46,671,873	-	5,225,766	-	58,204,892
-	65,013,900	-	27,166,375	-	-
<u>(161,259,804)</u>	<u>(168,486,003)</u>	<u>(181,769,445)</u>	<u>(184,028,124)</u>	<u>(193,970,504)</u>	<u>(218,241,042)</u>
111,970,254	256,078,053	121,647,179	163,267,055	130,329,507	194,322,332
<u>2,797,535,970</u>	<u>2,909,506,224</u>	<u>3,165,584,277</u>	<u>3,287,231,456</u>	<u>3,450,498,511</u>	<u>3,580,828,018</u>
<u>\$ 2,909,506,224</u>	<u>\$ 3,165,584,277</u>	<u>\$ 3,287,231,456</u>	<u>\$ 3,450,498,511</u>	<u>\$ 3,580,828,018</u>	<u>\$ 3,775,150,350</u>
\$ 120,614,676	\$ 129,685,755	\$ 138,290,237	\$ 147,849,683	\$ 156,366,867	\$ 167,196,611
45,984,957	48,445,698	50,973,950	51,747,946	54,257,364	57,300,892
9,581,643	10,842,796	7,222,913	14,897,125	18,789,375	16,658,315
(31,074,711)	208,322,511	185,429,727	340,243,524	(240,248,906)	196,292,584
(2,645,568)	(2,754,384)	(2,781,367)	(2,878,819)	(3,024,829)	(3,122,473)
(309,357)	(279,208)	(208,858)	(204,804)	(196,641)	(117,205)
(161,259,804)	(168,486,003)	(181,769,445)	(184,028,124)	(193,970,504)	(218,241,042)
(8,884,478)	(9,969,856)	(6,225,703)	(13,673,574)	(17,802,033)	(15,468,073)
<u>(318,812)</u>	<u>(318,812)</u>	<u>(321,386)</u>	<u>(320,288)</u>	<u>(174,374)</u>	<u>(174,375)</u>
(28,311,454)	215,488,497	190,610,068	353,632,669	(226,003,681)	200,325,234
<u>1,378,351,219</u>	<u>1,350,039,765</u>	<u>1,565,528,262</u>	<u>1,756,138,330</u>	<u>2,109,770,999</u>	<u>1,883,767,318</u>
<u>\$ 1,350,039,765</u>	<u>\$ 1,565,528,262</u>	<u>\$ 1,756,138,330</u>	<u>\$ 2,109,770,999</u>	<u>\$ 1,883,767,318</u>	<u>\$ 2,084,092,552</u>
<u>\$ 1,559,466,459</u>	<u>\$ 1,600,056,015</u>	<u>\$ 1,531,093,126</u>	<u>\$ 1,340,727,512</u>	<u>\$ 1,697,060,700</u>	<u>\$ 1,691,057,798</u>
46.40%	49.45%	53.42%	61.14%	52.61%	55.21%
\$ 471,115,185	\$ 492,109,775	\$ 513,201,283	\$ 519,239,589	\$ 541,233,353	\$ 567,243,261
331.02%	325.14%	298.34%	258.21%	313.55%	298.12%

SCHEDULE OF CONTRIBUTIONS

Year	Actuarially determined contribution	Contributions in relation to the actuarially determined contribution	Contribution deficiency (excess)	Covered payroll	Contributions as a percentage of covered payroll
December 31, 2023	\$ 163,724,213	\$ (167,184,938)	\$ (3,460,725)	\$ 567,243,261	29.47%
December 31, 2022	153,677,331	(156,335,119)	(2,657,788)	541,233,353	28.88%
December 31, 2021	144,255,207	(147,852,245)	(3,597,038)	519,239,589	28.47%
December 31, 2020	135,472,822	(138,290,237)	(2,817,415)	513,201,283	26.95%
December 31, 2019	127,151,838	(129,685,754)	(2,533,916)	492,109,775	26.35%
December 31, 2018	119,298,291	(120,614,676)	(1,316,385)	471,115,185	25.60%
December 31, 2017	112,017,087	(115,426,815)	(3,409,728)	451,777,105	25.55%
December 31, 2016	105,246,797	(107,067,707)	(1,820,910)	439,644,322	24.35%
December 31, 2015	98,792,642	(99,820,481)	(1,027,839)	432,382,921	23.09%
December 31, 2014	92,826,743	(93,400,946)	(574,203)	415,752,810	22.47%

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, 2023.....	10.95%
December 31, 2022.....	-11.54%
December 31, 2021.....	19.86%
December 31, 2020.....	12.26%
December 31, 2019.....	16.21%
December 31, 2018.....	-2.52%
December 31, 2017.....	17.25%
December 31, 2016.....	7.35%
December 31, 2015.....	0.61%
December 31, 2014.....	7.54%

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 PROVISIONS

The following changes were reflected in the January 1, 2024, actuarial valuation.

Changes in Assumptions

- None.

Changes in Plan Provisions

- Effective December 31, 2023, pursuant to chapter 269 of the Acts of 2022, the Board approved a one-time increase in the COLA from 3% to 5% effective July 1, 2022.

Audit of Specific Elements, Accounts and Items of Financial Statements

Middlesex County Retirement System

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*Audit of Specific Elements Accounts and
Items of Financial Statements*

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Independent Auditor's Report

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

Report on the Audit of the Schedule of Employer Allocations and Schedule of Pension Amounts by Employer

Opinion

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, 2023, 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 contributions and total pension expense included in the accompanying schedule pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2023, and the related notes.

In our opinion, the accompanying schedule of employer allocations and schedule of pension amounts by employer present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflows of resources, total contributions and total pension expense for the total of all participating entities for the MCRS as of and for the year ended December 31, 2023, in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Schedules section of our report. We are required to be independent of the MCRS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Schedules

Management is responsible for the preparation and fair presentation of the schedules in accordance with accounting principles generally accepted in the United States of America and for 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 Responsibilities for the Audit of the Schedules

Our objectives are to obtain reasonable assurance about whether the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer as a whole are free from material

misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the schedules.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the schedules, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the schedules.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purposes of expressing an opinion on the effectiveness of the MCRS's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the schedules.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Other Matter

We have audited, in accordance with GAAS, the financial statements of the MCRS as of and for the year ended December 31, 2023, and our report thereon, dated August 14, 2024 expressed an unmodified opinion on those financial statements.

Restriction on Use

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



August 14, 2024

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2023

Employer	Share of Net Pension Liability/(Asset)	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	56,665,288	3.350878%
Town of Ashby.....	1,505,590	0.089032%
Town of Ashland.....	38,782,403	2.293381%
Town of Ayer.....	22,587,224	1.335686%
Town of Bedford.....	59,004,049	3.489180%
Town of Billerica.....	163,804,814	9.686530%
Town of Boxborough.....	13,520,255	0.799515%
Town of Burlington.....	144,914,077	8.569434%
Town of Carlisle.....	16,210,292	0.958589%
Town of Chelmsford.....	120,898,338	7.149273%
Town of Dracut.....	75,090,691	4.440457%
Town of Dunstable.....	4,028,150	0.238203%
Town of Groton.....	23,696,683	1.401293%
Town of Holliston.....	28,063,006	1.659494%
Town of Hopkinton.....	27,101,615	1.602643%
Town of Hudson.....	71,536,588	4.230286%
Town of Lincoln.....	32,130,102	1.900000%
Town of Littleton.....	25,893,317	1.531191%
Town of North Reading.....	54,465,235	3.220779%
Town of Pepperell.....	16,995,063	1.004996%
Town of Sherborn.....	12,722,930	0.752365%
Town of Shirley.....	10,524,633	0.622370%
Town of Stow.....	14,559,897	0.860993%
Town of Sudbury.....	65,695,729	3.884890%
Town of Tewksbury.....	116,966,080	6.916741%
Town of Townsend.....	6,882,768	0.407010%
Town of Tyngsborough.....	26,555,868	1.570370%
Town of Wayland.....	62,127,083	3.673859%
Town of Westford.....	62,660,156	3.705382%
Town of Weston.....	73,443,424	4.343046%
Town of Wilmington.....	93,203,360	5.511542%
Acton-Boxborough Regional School District.....	32,314,927	1.910930%
Acton Water Supply.....	4,514,809	0.266981%
Bedford Housing Authority.....	376,352	0.022255%
Billerica Housing Authority.....	1,894,567	0.112034%
Chelmsford Housing Authority.....	2,791,904	0.165098%
Chelmsford Water District.....	732,694	0.043328%
Dracut Housing Authority.....	1,875,107	0.110884%
Dracut Water Supply.....	3,819,086	0.225840%

(Continued)

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2023

Employer	Share of Net Pension Liability/(Asset)	Percent of Total Net Pension Liability
East Chelmsford Water District.....	340,247	0.020120%
East Middlesex Mosquito Control.....	792,329	0.046854%
Greater Lowell Regional Vocational Technical School District.....	20,075,975	1.187184%
Groton-Dunstable Regional School District.....	15,368,239	0.908794%
Hudson Housing Authority.....	906,627	0.053613%
Lincoln-Sudbury Regional School District.....	10,386,487	0.614201%
Nashoba Valley Technical High School District.....	3,683,043	0.217795%
North Chelmsford Water District.....	1,742,783	0.103059%
North Middlesex Regional School District.....	14,594,252	0.863025%
Shawsheen Valley Regional Vocational School.....	9,594,986	0.567396%
South Middlesex Regional Vocational Technical School.....	7,400,154	0.437605%
Sudbury Water District.....	1,250,917	0.073972%
Tewksbury Housing Authority.....	2,151,337	0.127218%
Wayland Housing Authority.....	416,032	0.024602%
Hopkinton Housing Authority.....	621,215	0.036735%
Sudbury Housing Authority.....	554,364	0.032782%
Wilmington Housing Authority.....	137,041	0.008104%
Acton Housing Authority.....	1,015,010	0.060022%
Burlington Housing Authority.....	53,090	0.003139%
Ayer Housing Authority.....	688,618	0.040721%
Holliston Housing Authority.....	33,626	0.001988%
Littleton Housing Authority.....	686,302	0.040584%
Westford Housing Authority.....	789,669	0.046697%
Shirley Water District.....	395,361	0.023380%
Tyngsborough Housing Authority.....	573,626	0.033921%
Pepperell Housing Authority.....	243,694	0.014411%
Groton Housing Authority.....	-	0.000000%
Tyngsborough Water District.....	710,027	0.041987%
North Reading Housing Authority.....	39,272	0.002322%
West Groton Water.....	86,060	0.005089%
Ayer-Shirley Regional School District.....	5,094,198	0.301243%
Northern Middlesex Regional Emergency Communications Center.....	79,063	0.004675%
Total.....	\$ 1,691,057,798	100.000%

(Concluded)

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

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2023

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 56,442,883
Ending net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 56,665,288
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 1,630,344
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	2,905,028
Changes of assumptions.....	-	-	-	364,130
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	265,094
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 5,164,596
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ -	\$ -	\$ -	\$ 845,122
Pension Expense				
Proportionate share of plan pension expense.....	\$ 453,368	\$ -	\$ -	\$ 6,457,923
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(390,605)
Total Employer Pension Expense.....	\$ 453,368	\$ -	\$ -	\$ 6,067,318
Contributions				
Statutory required contribution.....	\$ 453,368	\$ -	\$ -	\$ 5,309,325
Contribution in relation to statutory required contribution.....	(453,368)	-	-	(5,345,128)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (35,803)
Contributions as a percentage of covered payroll.....	36.14%	N/A	N/A	33.31%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ -	\$ -	\$ -	\$ 568,594
June 30, 2026.....	-	-	-	1,066,423
June 30, 2027.....	-	-	-	2,680,565
June 30, 2028.....	-	-	-	3,892
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 4,319,474
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ -	\$ -	\$ -	\$ 70,940,898
Current discount rate (7.15%).....	\$ -	\$ -	\$ -	\$ 56,665,288
1% increase (8.15%).....	\$ -	\$ -	\$ -	\$ 44,651,882
Covered Payroll.....	\$ 1,254,426	\$ -	\$ -	\$ 16,048,362
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, 2023

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 2,195,503	\$ 39,177,494	\$ 21,132,333	\$ 58,143,653
Ending net pension liability/(asset).....	\$ 1,505,590	\$ 38,782,403	\$ 22,587,224	\$ 59,004,049
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 43,318	\$ 1,115,827	\$ 649,868	\$ 1,697,633
Net difference between projected and actual investment earnings on pension plan investments.....	77,186	1,988,236	1,157,967	3,024,928
Changes of assumptions.....	9,675	249,211	145,143	379,153
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	277,462	1,435,197	1,929,219	1,722,091
Total Deferred Outflows of Resources.....	\$ 407,641	\$ 4,788,471	\$ 3,882,197	\$ 6,823,805
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 453,904	\$ 1,089,890	\$ 147,650	\$ 471,465
Pension Expense				
Proportionate share of plan pension expense.....	\$ 171,586	\$ 4,419,888	\$ 2,574,181	\$ 6,724,472
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(66,071)	51,362	396,210	(134,403)
Total Employer Pension Expense.....	\$ 105,515	\$ 4,471,250	\$ 2,970,391	\$ 6,590,069
Contributions				
Statutory required contribution.....	\$ 254,095	\$ 3,905,242	\$ 2,096,798	\$ 5,458,202
Contribution in relation to statutory required contribution.....	(254,095)	(3,905,242)	(2,396,798)	(5,458,202)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (300,000)	\$ -
Contributions as a percentage of covered payroll.....	23.91%	23.44%	28.66%	24.58%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ (6,976)	\$ 576,988	\$ 834,754	\$ 1,220,413
June 30, 2026.....	3,331	938,500	1,023,701	1,793,961
June 30, 2027.....	59,415	2,229,005	1,576,751	3,242,869
June 30, 2028.....	(102,033)	(45,912)	299,341	95,097
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (46,263)	\$ 3,698,581	\$ 3,734,547	\$ 6,352,340
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 1,884,891	\$ 48,552,801	\$ 28,277,593	\$ 73,868,859
Current discount rate (7.15%).....	\$ 1,505,590	\$ 38,782,403	\$ 22,587,224	\$ 59,004,049
1% increase (8.15%).....	\$ 1,186,395	\$ 30,560,285	\$ 17,798,588	\$ 46,494,812
Covered Payroll.....	\$ 1,062,577	\$ 16,662,527	\$ 8,362,919	\$ 22,210,006
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, 2023

	Town of BillERICA	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 163,486,989	\$ 12,627,142	\$ 143,508,193	\$ 13,493,696
Ending net pension liability/(asset).....	\$ 163,804,814	\$ 13,520,255	\$ 144,914,077	\$ 16,210,292
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 4,712,905	\$ 388,998	\$ 4,169,391	\$ 466,394
Net difference between projected and actual investment earnings on pension plan investments.....	8,397,692	693,136	7,429,231	831,044
Changes of assumptions.....	1,052,592	86,880	931,202	104,166
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,117,069	617,690	1,120,488	3,087,879
Total Deferred Outflows of Resources.....	\$ 15,280,258	\$ 1,786,704	\$ 13,650,312	\$ 4,489,483
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 5,232,516	\$ 318,711	\$ 4,024,026	\$ 56,178
Pension Expense				
Proportionate share of plan pension expense.....	\$ 18,668,227	\$ 1,540,852	\$ 16,515,318	\$ 1,847,425
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(838,094)	184,987	62,668	793,155
Total Employer Pension Expense.....	\$ 17,830,133	\$ 1,725,839	\$ 16,577,986	\$ 2,640,580
Contributions				
Statutory required contribution.....	\$ 15,421,709	\$ 1,245,470	\$ 13,403,482	\$ 1,402,244
Contribution in relation to statutory required contribution.....	(15,421,709)	(1,245,470)	(13,403,482)	(1,402,244)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.73%	36.45%	32.85%	21.25%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 1,546,788	\$ 247,133	\$ 1,447,961	\$ 1,098,479
June 30, 2026.....	2,762,979	346,899	2,593,636	1,263,193
June 30, 2027.....	5,790,872	728,640	5,478,102	1,621,009
June 30, 2028.....	(52,897)	145,321	106,587	450,624
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 10,047,742	\$ 1,467,993	\$ 9,626,286	\$ 4,433,305
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 205,071,939	\$ 16,926,395	\$ 181,422,084	\$ 20,294,129
Current discount rate (7.15%).....	\$ 163,804,814	\$ 13,520,255	\$ 144,914,077	\$ 16,210,292
1% increase (8.15%).....	\$ 129,077,143	\$ 10,653,874	\$ 114,191,363	\$ 12,773,606
Covered Payroll.....	\$ 41,992,311	\$ 3,417,136	\$ 40,805,162	\$ 6,599,149
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, 2023

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 117,848,343	\$ 75,091,196	\$ 3,248,740	\$ 25,150,097
Ending net pension liability/(asset).....	\$ 120,898,338	\$ 75,090,691	\$ 4,028,150	\$ 23,696,683
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 3,478,423	\$ 2,160,470	\$ 115,896	\$ 681,788
Net difference between projected and actual investment earnings on pension plan investments.....	6,198,029	3,849,633	206,509	1,214,845
Changes of assumptions.....	776,879	482,524	25,884	152,272
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,317,307	1,608,071	785,225	570,324
Total Deferred Outflows of Resources.....	\$ 13,770,638	\$ 8,100,698	\$ 1,133,514	\$ 2,619,229
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 4,646,139	\$ 2,117,715	\$ 191,314	\$ 1,797,534
Pension Expense				
Proportionate share of plan pension expense.....	\$ 13,778,333	\$ 8,557,808	\$ 459,073	\$ 2,700,624
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(188,726)	359,430	177,378	(224,135)
Total Employer Pension Expense.....	\$ 13,589,607	\$ 8,917,238	\$ 636,451	\$ 2,476,489
Contributions				
Statutory required contribution.....	\$ 11,333,552	\$ 7,203,532	\$ 365,094	\$ 2,494,280
Contribution in relation to statutory required contribution.....	(11,335,407)	(7,203,874)	(365,094)	(2,494,280)
Contribution deficiency/(excess).....	\$ (1,855)	\$ (342)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	34.19%	37.14%	25.25%	27.51%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 1,641,814	\$ 1,350,684	\$ 192,460	\$ (102,397)
June 30, 2026.....	2,519,896	1,906,879	217,318	86,494
June 30, 2027.....	4,507,226	2,748,971	398,438	1,060,975
June 30, 2028.....	455,563	(23,551)	133,984	(223,377)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 9,124,499	\$ 5,982,983	\$ 942,200	\$ 821,695
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 151,356,092	\$ 94,008,187	\$ 5,042,956	\$ 29,666,566
Current discount rate (7.15%).....	\$ 120,898,338	\$ 75,090,691	\$ 4,028,150	\$ 23,696,683
1% increase (8.15%).....	\$ 95,267,115	\$ 59,170,983	\$ 3,174,156	\$ 18,672,834
Covered Payroll.....	\$ 33,151,794	\$ 19,399,126	\$ 1,445,859	\$ 9,066,226
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, 2023

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 27,235,114	\$ 29,030,303	\$ 75,932,435	\$ 32,224,079
Ending net pension liability/(asset).....	\$ 28,063,006	\$ 27,101,615	\$ 71,536,588	\$ 32,130,102
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 807,414	\$ 779,753	\$ 2,058,213	\$ 924,430
Net difference between projected and actual investment earnings on pension plan investments.....	1,438,691	1,389,404	3,667,427	1,647,196
Changes of assumptions.....	180,330	174,152	459,686	206,464
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>3,022,225</u>	<u>4,448,679</u>	<u>823,827</u>	<u>1,074,257</u>
Total Deferred Outflows of Resources.....	\$ <u>5,448,660</u>	\$ <u>6,791,988</u>	\$ <u>7,009,153</u>	\$ <u>3,852,347</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ <u>1,553,247</u>	\$ <u>2,642,203</u>	\$ <u>2,698,837</u>	\$ <u>87,841</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 3,198,236	\$ 3,088,670	\$ 8,152,758	\$ 3,661,748
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(61,275)</u>	<u>408,670</u>	<u>(601,450)</u>	<u>312,115</u>
Total Employer Pension Expense.....	\$ <u>3,136,961</u>	\$ <u>3,495,340</u>	\$ <u>7,551,308</u>	\$ <u>3,973,863</u>
Contributions				
Statutory required contribution.....	\$ 2,720,260	\$ 3,104,074	\$ 7,441,621	\$ 3,050,494
Contribution in relation to statutory required contribution.....	<u>(2,720,260)</u>	<u>(3,104,074)</u>	<u>(7,441,621)</u>	<u>(3,050,494)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	20.35%	14.98%	31.84%	24.92%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 601,804	\$ 791,792	\$ 899,437	\$ 947,357
June 30, 2026.....	905,108	1,125,440	1,498,658	1,225,832
June 30, 2027.....	2,243,473	2,485,437	2,605,674	1,624,563
June 30, 2028.....	<u>145,028</u>	<u>(252,884)</u>	<u>(693,453)</u>	<u>(33,246)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>3,895,413</u>	\$ <u>4,149,785</u>	\$ <u>4,310,316</u>	\$ <u>3,764,506</u>
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 35,132,881	\$ 33,929,288	\$ 89,558,704	\$ 40,224,595
Current discount rate (7.15%).....	\$ 28,063,006	\$ 27,101,615	\$ 71,536,588	\$ 32,130,102
1% increase (8.15%).....	\$ 22,113,469	\$ 21,355,899	\$ 56,370,372	\$ 25,318,314
Covered Payroll.....	\$ 13,368,469	\$ 20,722,283	\$ 23,371,212	\$ 12,243,307
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, 2023

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 30,512,028	\$ 55,154,781	\$ 19,372,966	\$ 11,793,029
Ending net pension liability/(asset).....	\$ 25,893,317	\$ 54,465,235	\$ 16,995,063	\$ 12,722,930
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 744,989	\$ 1,567,045	\$ 488,973	\$ 366,057
Net difference between projected and actual investment earnings on pension plan investments.....	1,327,459	2,792,239	871,277	652,259
Changes of assumptions.....	166,388	349,988	109,208	81,756
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,397,992	191,293	6,490	1,242,276
Total Deferred Outflows of Resources.....	\$ 5,636,828	\$ 4,900,565	\$ 1,475,948	\$ 2,342,348
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,203,102	\$ 1,274,724	\$ 1,503,977	\$ -
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,950,963	\$ 6,207,200	\$ 1,936,865	\$ 1,449,985
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,056,599	(559,494)	(402,632)	123,225
Total Employer Pension Expense.....	\$ 4,007,562	\$ 5,647,706	\$ 1,534,233	\$ 1,573,210
Contributions				
Statutory required contribution.....	\$ 3,110,711	\$ 5,210,793	\$ 1,941,379	\$ 1,236,905
Contribution in relation to statutory required contribution.....	(5,167,031)	(5,210,793)	(1,941,379)	(1,236,905)
Contribution deficiency/(excess).....	\$ (2,056,320)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	30.86%	33.74%	30.45%	24.88%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 1,270,864	\$ 602,836	\$ (102,224)	\$ 571,348
June 30, 2026.....	1,541,802	1,050,654	34,197	676,157
June 30, 2027.....	1,919,298	2,115,666	408,758	929,104
June 30, 2028.....	(298,238)	(143,315)	(368,760)	165,739
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 4,433,726	\$ 3,625,841	\$ (28,029)	\$ 2,342,348
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 32,416,585	\$ 68,186,588	\$ 21,276,606	\$ 15,928,201
Current discount rate (7.15%).....	\$ 25,893,317	\$ 54,465,235	\$ 16,995,063	\$ 12,722,930
1% increase (8.15%).....	\$ 20,403,768	\$ 42,918,256	\$ 13,392,001	\$ 10,025,587
Covered Payroll.....	\$ 16,743,124	\$ 15,445,769	\$ 6,374,629	\$ 4,971,947
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, 2023

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 10,265,353	\$ 14,182,336	\$ 66,845,536	\$ 115,583,007
Ending net pension liability/(asset).....	\$ 10,524,633	\$ 14,559,897	\$ 65,695,729	\$ 116,966,080
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 302,809	\$ 418,910	\$ 1,890,163	\$ 3,365,286
Net difference between projected and actual investment earnings on pension plan investments.....	539,561	746,434	3,367,987	5,996,436
Changes of assumptions.....	67,630	93,560	422,153	751,611
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	510,738	788,818	137,566	3,962,833
Total Deferred Outflows of Resources.....	\$ 1,420,738	\$ 2,047,722	\$ 5,817,869	\$ 14,076,166
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 395,097	\$ 191,290	\$ 2,058,037	\$ 5,889,381
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,199,454	\$ 1,659,337	\$ 7,487,097	\$ 13,330,188
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	80,903	265,242	(819,033)	(81,774)
Total Employer Pension Expense.....	\$ 1,280,357	\$ 1,924,579	\$ 6,668,064	\$ 13,248,414
Contributions				
Statutory required contribution.....	\$ 1,016,240	\$ 1,334,265	\$ 6,370,873	\$ 10,932,548
Contribution in relation to statutory required contribution.....	(1,016,240)	(1,334,265)	(6,370,873)	(10,932,548)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	42.68%	29.46%	31.49%	41.27%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 250,334	\$ 510,139	\$ 528,742	\$ 1,791,109
June 30, 2026.....	330,607	634,066	1,052,079	2,633,999
June 30, 2027.....	400,267	661,713	2,391,686	3,608,386
June 30, 2028.....	44,433	50,524	(212,675)	153,291
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,025,641	\$ 1,856,432	\$ 3,759,832	\$ 8,186,785
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 13,176,090	\$ 18,227,952	\$ 82,246,365	\$ 146,433,186
Current discount rate (7.15%).....	\$ 10,524,633	\$ 14,559,897	\$ 65,695,729	\$ 116,966,080
1% increase (8.15%).....	\$ 8,293,343	\$ 11,473,105	\$ 51,767,813	\$ 92,168,521
Covered Payroll.....	\$ 2,381,326	\$ 4,529,512	\$ 20,232,436	\$ 26,490,728
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, 2023

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 7,565,089	\$ 27,541,050	\$ 60,047,515	\$ 65,161,824
Ending net pension liability/(asset).....	\$ 6,882,768	\$ 26,555,868	\$ 62,127,083	\$ 62,660,156
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 198,027	\$ 764,051	\$ 1,787,487	\$ 1,802,825
Net difference between projected and actual investment earnings on pension plan investments.....	352,855	1,361,425	3,185,035	3,212,364
Changes of assumptions.....	44,228	170,645	399,222	402,647
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	990,752	578,237	2,399,328	4,615,398
Total Deferred Outflows of Resources.....	\$ 1,585,862	\$ 2,874,358	\$ 7,771,072	\$ 10,033,234
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,199,170	\$ 488,332	\$ 1,349,683	\$ 2,983,703
Pension Expense				
Proportionate share of plan pension expense.....	\$ 784,405	\$ 3,026,474	\$ 7,080,392	\$ 7,141,145
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(309,478)	295,579	(274,065)	166,235
Total Employer Pension Expense.....	\$ 474,927	\$ 3,322,053	\$ 6,806,327	\$ 7,307,380
Contributions				
Statutory required contribution.....	\$ 891,023	\$ 2,802,097	\$ 5,907,067	\$ 6,522,668
Contribution in relation to statutory required contribution.....	(891,023)	(2,805,247)	(5,907,067)	(6,522,668)
Contribution deficiency/(excess).....	\$ -	\$ (3,150)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	20.04%	27.03%	26.38%	22.26%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ (78,837)	\$ 530,211	\$ 1,001,978	\$ 1,367,012
June 30, 2026.....	(25,693)	744,033	1,548,026	1,971,655
June 30, 2027.....	569,363	1,244,906	3,529,184	4,075,969
June 30, 2028.....	(78,141)	(133,124)	342,201	(365,105)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 386,692	\$ 2,386,026	\$ 6,421,389	\$ 7,049,531
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 8,616,734	\$ 33,246,052	\$ 77,778,675	\$ 78,446,044
Current discount rate (7.15%).....	\$ 6,882,768	\$ 26,555,868	\$ 62,127,083	\$ 62,660,156
1% increase (8.15%).....	\$ 5,423,577	\$ 20,925,854	\$ 48,955,743	\$ 49,375,801
Covered Payroll.....	\$ 4,446,532	\$ 10,378,946	\$ 22,389,383	\$ 29,308,551
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, 2023

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 73,861,876	\$ 93,568,182	\$ 32,804,832	\$ 4,310,937
Ending net pension liability/(asset).....	\$ 73,443,424	\$ 93,203,360	\$ 32,314,927	\$ 4,514,809
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,113,075	\$ 2,681,598	\$ 929,748	\$ 129,898
Net difference between projected and actual investment earnings on pension plan investments.....	3,765,184	4,778,206	1,656,672	231,458
Changes of assumptions.....	471,939	598,914	207,652	29,012
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,349,910	665,797	920,375	136,588
Total Deferred Outflows of Resources.....	\$ 7,700,108	\$ 8,724,515	\$ 3,714,447	\$ 526,956
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 981,494	\$ 1,104,940	\$ 643,260	\$ 17,150
Pension Expense				
Proportionate share of plan pension expense.....	\$ 8,370,074	\$ 10,622,040	\$ 3,682,812	\$ 514,535
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	29,525	(17,874)	161,850	(2,470)
Total Employer Pension Expense.....	\$ 8,399,599	\$ 10,604,166	\$ 3,844,662	\$ 512,065
Contributions				
Statutory required contribution.....	\$ 6,912,365	\$ 8,908,246	\$ 3,367,439	\$ 330,838
Contribution in relation to statutory required contribution.....	(7,912,365)	(8,908,630)	(3,367,439)	(330,838)
Contribution deficiency/(excess).....	\$ (1,000,000)	\$ (384)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	34.06%	33.10%	20.06%	28.64%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 1,431,781	\$ 1,509,572	\$ 563,206	\$ 101,114
June 30, 2026.....	2,058,064	2,279,855	803,430	156,229
June 30, 2027.....	3,153,313	3,931,149	1,748,882	237,841
June 30, 2028.....	75,456	(101,001)	(44,331)	14,622
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 6,718,614	\$ 7,619,575	\$ 3,071,187	\$ 509,806
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 91,945,926	\$ 116,683,956	\$ 40,455,983	\$ 5,652,219
Current discount rate (7.15%).....	\$ 73,443,424	\$ 93,203,360	\$ 32,314,927	\$ 4,514,809
1% increase (8.15%).....	\$ 57,872,947	\$ 73,443,650	\$ 25,463,955	\$ 3,557,641
Covered Payroll.....	\$ 23,232,459	\$ 26,917,809	\$ 16,789,694	\$ 1,155,228
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, 2023

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 357,375	\$ 1,270,401	\$ 2,873,470	\$ 819,895
Ending net pension liability/(asset).....	\$ 376,352	\$ 1,894,567	\$ 2,791,904	\$ 732,694
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 10,828	\$ 54,509	\$ 80,327	\$ 21,081
Net difference between projected and actual investment earnings on pension plan investments.....	19,294	97,128	143,131	37,563
Changes of assumptions.....	2,418	12,174	17,940	4,708
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	27,723	394,204	500,744	1,108,302
Total Deferred Outflows of Resources.....	\$ 60,263	\$ 558,015	\$ 742,142	\$ 1,171,654
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 9,901	\$ 176,375	\$ 36,934	\$ 520,106
Pension Expense				
Proportionate share of plan pension expense.....	\$ 42,894	\$ 215,919	\$ 318,183	\$ 83,503
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	980	37,690	128,366	45,541
Total Employer Pension Expense.....	\$ 43,874	\$ 253,609	\$ 446,549	\$ 129,044
Contributions				
Statutory required contribution.....	\$ 32,681	\$ 113,735	\$ 297,353	\$ 52,448
Contribution in relation to statutory required contribution.....	(32,681)	(113,735)	(357,353)	(52,448)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (60,000)	\$ -
Contributions as a percentage of covered payroll.....	24.81%	28.70%	10.00%	3.92%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 9,146	\$ 44,197	\$ 186,001	\$ 117,197
June 30, 2026.....	13,021	59,188	222,892	169,789
June 30, 2027.....	25,601	180,727	293,887	383,968
June 30, 2028.....	2,594	97,528	2,428	(19,406)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 50,362	\$ 381,640	\$ 705,208	\$ 651,548
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 471,166	\$ 2,371,863	\$ 3,495,265	\$ 917,281
Current discount rate (7.15%).....	\$ 376,352	\$ 1,894,567	\$ 2,791,904	\$ 732,694
1% increase (8.15%).....	\$ 296,563	\$ 1,492,907	\$ 2,200,002	\$ 577,358
Covered Payroll.....	\$ 131,725	\$ 398,320	\$ 3,573,684	\$ 1,336,985
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, 2023

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 1,967,855	\$ 3,773,011	\$ 358,607	\$ 843,725
Ending net pension liability/(asset).....	\$ 1,875,107	\$ 3,819,086	\$ 340,247	\$ 792,329
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 53,950	\$ 109,881	\$ 9,789	\$ 22,796
Net difference between projected and actual investment earnings on pension plan investments.....	96,130	195,791	17,443	40,620
Changes of assumptions.....	12,049	24,541	2,186	5,091
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	832	127,956	71,406	125,772
Total Deferred Outflows of Resources.....	\$ 162,961	\$ 458,169	\$ 100,824	\$ 194,279
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 308,700	\$ 203,938	\$ 69,319	\$ 97,228
Pension Expense				
Proportionate share of plan pension expense.....	\$ 213,700	\$ 435,247	\$ 38,778	\$ 90,299
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(110,302)	(17,135)	(7,846)	4,508
Total Employer Pension Expense.....	\$ 103,398	\$ 418,112	\$ 30,932	\$ 94,807
Contributions				
Statutory required contribution.....	\$ 164,851	\$ 316,875	\$ 34,525	\$ 65,087
Contribution in relation to statutory required contribution.....	(167,722)	(316,875)	(34,525)	(65,087)
Contribution deficiency/(excess).....	\$ (2,871)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	37.50%	41.99%	14.77%	18.85%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ (87,679)	\$ 56,365	\$ (3,315)	\$ 13,696
June 30, 2026.....	(72,743)	91,832	1,289	27,993
June 30, 2027.....	34,304	108,882	36,548	66,995
June 30, 2028.....	(19,621)	(2,848)	(3,017)	(11,633)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (145,739)	\$ 254,231	\$ 31,505	\$ 97,051
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 2,347,500	\$ 4,781,223	\$ 425,965	\$ 991,939
Current discount rate (7.15%).....	\$ 1,875,107	\$ 3,819,086	\$ 340,247	\$ 792,329
1% increase (8.15%).....	\$ 1,477,572	\$ 3,009,415	\$ 268,112	\$ 624,350
Covered Payroll.....	\$ 447,219	\$ 754,572	\$ 233,823	\$ 345,200
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, 2023

	Greater Lowell Regional Vocational Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 20,251,238	\$ 14,947,853	\$ 807,927	\$ 10,259,862
Ending net pension liability/(asset).....	\$ 20,075,975	\$ 15,368,239	\$ 906,627	\$ 10,386,487
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 577,615	\$ 442,167	\$ 26,085	\$ 298,834
Net difference between projected and actual investment earnings on pension plan investments.....	1,029,224	787,875	46,480	532,478
Changes of assumptions.....	129,006	98,755	5,826	66,742
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	579,466	648,413	110,520	275,362
Total Deferred Outflows of Resources.....	\$ 2,315,311	\$ 1,977,210	\$ 188,911	\$ 1,173,416
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,275,481	\$ 27,598	\$ 2,748	\$ 225,273
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,287,985	\$ 1,751,461	\$ 103,325	\$ 1,183,710
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	19,507	274,307	(58,111)	(17,804)
Total Employer Pension Expense.....	\$ 2,307,492	\$ 2,025,768	\$ 45,214	\$ 1,165,906
Contributions				
Statutory required contribution.....	\$ 1,780,273	\$ 1,373,329	\$ 72,524	\$ 913,596
Contribution in relation to statutory required contribution.....	(1,780,273)	(1,373,329)	(72,524)	(913,596)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	33.87%	30.60%	14.82%	29.22%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 202,439	\$ 457,520	\$ 45,773	\$ 218,350
June 30, 2026.....	383,985	614,350	56,145	314,957
June 30, 2027.....	520,196	827,502	69,751	411,984
June 30, 2028.....	(66,790)	50,240	14,494	2,852
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,039,830	\$ 1,949,612	\$ 186,163	\$ 948,143
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 25,133,688	\$ 19,239,939	\$ 1,135,032	\$ 13,003,141
Current discount rate (7.15%).....	\$ 20,075,975	\$ 15,368,239	\$ 906,627	\$ 10,386,487
1% increase (8.15%).....	\$ 15,819,740	\$ 12,110,074	\$ 714,416	\$ 8,184,485
Covered Payroll.....	\$ 5,256,908	\$ 4,488,209	\$ 489,311	\$ 3,127,054
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, 2023

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 3,773,754	\$ 1,229,309	\$ 14,660,062	\$ 9,786,464
Ending net pension liability/(asset).....	\$ 3,683,043	\$ 1,742,783	\$ 14,594,252	\$ 9,594,986
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 105,967	\$ 50,142	\$ 419,898	\$ 276,062
Net difference between projected and actual investment earnings on pension plan investments.....	188,817	89,346	748,196	491,901
Changes of assumptions.....	23,667	11,199	93,781	61,656
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	104,385	523,229	202,593	216,512
Total Deferred Outflows of Resources.....	\$ 422,836	\$ 673,916	\$ 1,464,468	\$ 1,046,131
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 349,869	\$ 113,259	\$ 42,245	\$ 461,694
Pension Expense				
Proportionate share of plan pension expense.....	\$ 419,741	\$ 198,618	\$ 1,663,254	\$ 1,093,506
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(52,247)	81,193	68,563	(28,804)
Total Employer Pension Expense.....	\$ 367,494	\$ 279,811	\$ 1,731,817	\$ 1,064,702
Contributions				
Statutory required contribution.....	\$ 377,582	\$ 95,159	\$ 1,410,189	\$ 904,644
Contribution in relation to statutory required contribution.....	(377,582)	(95,159)	(1,410,189)	(904,644)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.17%	14.16%	24.05%	27.11%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 6,191	\$ 113,738	\$ 289,565	\$ 121,433
June 30, 2026.....	23,189	141,438	421,508	204,065
June 30, 2027.....	56,124	228,521	725,473	299,383
June 30, 2028.....	(12,537)	76,960	(14,323)	(40,444)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 72,967	\$ 560,657	\$ 1,422,223	\$ 584,437
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 4,610,907	\$ 2,181,840	\$ 18,270,962	\$ 12,012,238
Current discount rate (7.15%).....	\$ 3,683,043	\$ 1,742,783	\$ 14,594,252	\$ 9,594,986
1% increase (8.15%).....	\$ 2,902,214	\$ 1,373,302	\$ 11,500,177	\$ 7,580,787
Covered Payroll.....	\$ 1,043,817	\$ 672,107	\$ 5,863,270	\$ 3,336,441
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, 2023

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 7,705,068	\$ 2,303,019	\$ 1,805,120	\$ 671,550
Ending net pension liability/(asset).....	\$ 7,400,154	\$ 1,250,917	\$ 2,151,337	\$ 416,032
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 212,913	\$ 35,991	\$ 61,897	\$ 11,970
Net difference between projected and actual investment earnings on pension plan investments.....	379,380	64,130	110,291	21,328
Changes of assumptions.....	47,553	8,038	13,824	2,673
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	118,456	269,691	219,536	106,725
Total Deferred Outflows of Resources.....	\$ 758,302	\$ 377,850	\$ 405,548	\$ 142,696
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 353,657	\$ 1,072,756	\$ 44,241	\$ 248,149
Pension Expense				
Proportionate share of plan pension expense.....	\$ 843,368	\$ 142,560	\$ 245,179	\$ 47,412
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(101,522)	(203,674)	44,637	(59,803)
Total Employer Pension Expense.....	\$ 741,846	\$ (61,114)	\$ 289,816	\$ (12,391)
Contributions				
Statutory required contribution.....	\$ 704,878	\$ 156,230	\$ 160,199	\$ 56,113
Contribution in relation to statutory required contribution.....	(704,878)	(156,230)	(160,199)	(56,113)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	26.92%	14.91%	29.85%	17.11%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 73,823	\$ (254,110)	\$ 75,164	\$ (41,428)
June 30, 2026.....	145,474	(225,699)	96,147	(33,617)
June 30, 2027.....	243,252	(33,627)	137,935	12,220
June 30, 2028.....	(57,904)	(181,470)	52,061	(42,628)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 404,645	\$ (694,906)	\$ 361,307	\$ (105,453)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 9,264,465	\$ 1,566,059	\$ 2,693,320	\$ 520,842
Current discount rate (7.15%).....	\$ 7,400,154	\$ 1,250,917	\$ 2,151,337	\$ 416,032
1% increase (8.15%).....	\$ 5,831,274	\$ 985,715	\$ 1,695,240	\$ 327,831
Covered Payroll.....	\$ 2,618,631	\$ 1,048,146	\$ 536,594	\$ 327,989
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, 2023

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 591,913	\$ 534,374	\$ 233,342	\$ 1,015,501
Ending net pension liability/(asset).....	\$ 621,215	\$ 554,364	\$ 137,041	\$ 1,015,010
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 17,873	\$ 15,950	\$ 3,943	\$ 29,203
Net difference between projected and actual investment earnings on pension plan investments.....	31,847	28,420	7,026	52,036
Changes of assumptions.....	3,992	3,562	881	6,522
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	34,342	34,520	9,813	47,109
Total Deferred Outflows of Resources.....	\$ 88,054	\$ 82,452	\$ 21,663	\$ 134,870
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 25,745	\$ 26,563	\$ 117,646	\$ 26,941
Pension Expense				
Proportionate share of plan pension expense.....	\$ 70,797	\$ 63,180	\$ 15,619	\$ 115,678
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,391	3,253	(38,079)	7,115
Total Employer Pension Expense.....	\$ 75,188	\$ 66,433	\$ (22,460)	\$ 122,793
Contributions				
Statutory required contribution.....	\$ 55,738	\$ 52,795	\$ 24,139	\$ 87,654
Contribution in relation to statutory required contribution.....	(55,738)	(52,795)	(24,139)	(87,654)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	54.65%	54.49%	12.83%	16.95%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 13,740	\$ 13,586	\$ (37,753)	\$ 18,881
June 30, 2026.....	19,602	18,681	(37,413)	31,025
June 30, 2027.....	24,687	20,296	(5,735)	60,372
June 30, 2028.....	4,280	3,326	(15,082)	(2,349)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 62,309	\$ 55,889	\$ (95,983)	\$ 107,929
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 777,717	\$ 694,024	\$ 171,566	\$ 1,270,720
Current discount rate (7.15%).....	\$ 621,215	\$ 554,364	\$ 137,041	\$ 1,015,010
1% increase (8.15%).....	\$ 489,513	\$ 436,835	\$ 107,987	\$ 799,821
Covered Payroll.....	\$ 101,991	\$ 96,896	\$ 188,084	\$ 516,982
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, 2023

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 198,080	\$ 753,718	\$ 159,405	\$ 660,639
Ending net pension liability/(asset).....	\$ 53,090	\$ 688,618	\$ 33,626	\$ 686,302
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,527	\$ 19,813	\$ 967	\$ 19,746
Net difference between projected and actual investment earnings on pension plan investments.....	2,722	35,303	1,724	35,184
Changes of assumptions.....	341	4,425	216	4,410
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	113,832	316	25,912	62,874
Total Deferred Outflows of Resources.....	\$ 118,422	\$ 59,857	\$ 28,819	\$ 122,214
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 212,465	\$ 134,975	\$ 97,996	\$ 101,568
Pension Expense				
Proportionate share of plan pension expense.....	\$ 6,049	\$ 78,480	\$ 3,831	\$ 78,215
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(15,474)	(39,140)	(18,537)	14,051
Total Employer Pension Expense.....	\$ (9,425)	\$ 39,340	\$ (14,706)	\$ 92,266
Contributions				
Statutory required contribution.....	\$ 18,072	\$ 73,004	\$ 19,430	\$ 57,173
Contribution in relation to statutory required contribution.....	(18,072)	(73,004)	(19,430)	(57,173)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	7.95%	39.13%	18.73%	N/A
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ (45,915)	\$ (35,282)	\$ (20,387)	\$ 5,934
June 30, 2026.....	(41,785)	(29,808)	(20,339)	11,485
June 30, 2027.....	17,030	452	(9,167)	581
June 30, 2028.....	(23,373)	(10,480)	(19,284)	2,646
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (94,043)	\$ (75,118)	\$ (69,177)	\$ 20,646
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 66,465	\$ 862,101	\$ 42,097	\$ 859,201
Current discount rate (7.15%).....	\$ 53,090	\$ 688,618	\$ 33,626	\$ 686,302
1% increase (8.15%).....	\$ 41,835	\$ 542,627	\$ 26,497	\$ 540,802
Covered Payroll.....	\$ 227,257	\$ 186,559	\$ 103,737	\$ -
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, 2023

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 456,630	\$ 558,390	\$ 577,242	\$ 248,169
Ending net pension liability/(asset).....	\$ 789,669	\$ 395,361	\$ 573,626	\$ 243,694
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 22,720	\$ 11,375	\$ 16,504	\$ 7,011
Net difference between projected and actual investment earnings on pension plan investments.....	40,484	20,269	29,408	12,493
Changes of assumptions.....	5,074	2,541	3,686	1,566
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	275,242	80,121	22,221	1,671
Total Deferred Outflows of Resources.....	\$ 343,520	\$ 114,306	\$ 71,819	\$ 22,741
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 77,045	\$ 160,446	\$ 34,355	\$ 11,017
Pension Expense				
Proportionate share of plan pension expense.....	\$ 89,995	\$ 45,058	\$ 65,374	\$ 27,773
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	33,973	(18,515)	(1,730)	6,642
Total Employer Pension Expense.....	\$ 123,968	\$ 26,543	\$ 63,644	\$ 34,415
Contributions				
Statutory required contribution.....	\$ 46,868	\$ 38,447	\$ 57,544	\$ 28,680
Contribution in relation to statutory required contribution.....	(46,868)	(38,447)	(57,544)	(28,680)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	10.68%	15.00%	41.72%	26.27%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 47,465	\$ (20,657)	\$ 9,847	\$ 860
June 30, 2026.....	55,394	(12,100)	13,031	2,378
June 30, 2027.....	110,027	15,819	14,911	8,303
June 30, 2028.....	53,589	(29,202)	(325)	183
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 266,475	\$ (46,140)	\$ 37,464	\$ 11,724
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 988,609	\$ 494,964	\$ 718,139	\$ 305,087
Current discount rate (7.15%).....	\$ 789,669	\$ 395,361	\$ 573,626	\$ 243,694
1% increase (8.15%).....	\$ 622,254	\$ 311,542	\$ 452,014	\$ 192,029
Covered Payroll.....	\$ 439,035	\$ 258,361	\$ 137,933	\$ 109,186
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, 2023

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ 597,899	\$ 65,307	\$ 76,911
Ending net pension liability/(asset).....	\$ -	\$ 710,027	\$ 39,272	\$ 86,060
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 20,429	\$ 1,130	\$ 2,476
Net difference between projected and actual investment earnings on pension plan investments.....	-	36,401	2,013	4,412
Changes of assumptions.....	-	4,563	252	553
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	573	131,986	29,034	66,845
Total Deferred Outflows of Resources.....	\$ 573	\$ 193,379	\$ 32,429	\$ 74,286
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ -	\$ 9,918	\$ 80,264	\$ 25,770
Pension Expense				
Proportionate share of plan pension expense.....	\$ -	\$ 80,918	\$ 4,477	\$ 9,807
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,839	32,278	(17,174)	7,031
Total Employer Pension Expense.....	\$ 2,839	\$ 113,196	\$ (12,697)	\$ 16,838
Contributions				
Statutory required contribution.....	\$ -	\$ 53,128	\$ 8,671	\$ 2,315
Contribution in relation to statutory required contribution.....	-	(53,128)	(8,671)	(2,315)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	N/A	27.71%	27.17%	1.01%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2025.....	\$ 573	\$ 42,945	\$ (25,308)	\$ 9,081
June 30, 2026.....	-	52,788	(26,225)	12,933
June 30, 2027.....	-	70,875	7,390	26,080
June 30, 2028.....	-	16,853	(3,692)	422
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 573	\$ 183,461	\$ (47,835)	\$ 48,516
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ -	\$ 888,903	\$ 49,166	\$ 107,741
Current discount rate (7.15%).....	\$ -	\$ 710,027	\$ 39,272	\$ 86,060
1% increase (8.15%).....	\$ -	\$ 559,497	\$ 30,946	\$ 67,815
Covered Payroll.....	\$ -	\$ 191,704	\$ 31,913	\$ 228,442
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, 2023

	Ayer-Shirley Regional School District	Northern Middlesex Regional Emergency Communications Center	Totals
Net Pension Liability			
Beginning net pension liability/(asset).....	\$ 4,746,593	\$ 582,488	\$ 1,697,060,700
Ending net pension liability/(asset).....	\$ 5,094,198	\$ 79,063	\$ 1,691,057,798
Deferred Outflows of Resources			
Differences between expected and actual experience.....	\$ 146,568	\$ 2,275	\$ 48,654,218
Net difference between projected and actual investment earnings on pension plan investments.....	261,161	4,053	86,694,535
Changes of assumptions.....	32,735	508	10,866,550
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,431,054	198,024	57,413,811
Total Deferred Outflows of Resources.....	\$ 1,871,518	\$ 204,860	\$ 203,629,114
Deferred Inflows of Resources			
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 655,213	\$ 318,781	\$ 57,413,811
Pension Expense			
Proportionate share of plan pension expense.....	\$ 580,567	\$ 9,011	\$ 193,176,927
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	29,539	7,939	-
Total Employer Pension Expense.....	\$ 610,106	\$ 16,950	\$ 193,176,927
Contributions			
Statutory required contribution.....	\$ 497,092	\$ 62,893	\$ 163,724,213
Contribution in relation to statutory required contribution.....	(497,092)	(62,893)	(167,184,938)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (3,460,725)
Contributions as a percentage of covered payroll.....	11.45%	5.79%	29.47%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense			
June 30, 2025.....	\$ 196,057	\$ 9,227	\$ 27,533,230
June 30, 2026.....	268,539	12,505	41,753,292
June 30, 2027.....	689,405	(56,578)	77,631,844
June 30, 2028.....	62,304	(79,075)	(703,063)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,216,305	\$ (113,921)	\$ 146,215,303
Discount Rate Sensitivity			
1% decrease (6.15%).....	\$ 6,377,572	\$ 98,981	\$ 2,117,083,698
Current discount rate (7.15%).....	\$ 5,094,198	\$ 79,063	\$ 1,691,057,798
1% increase (8.15%).....	\$ 4,014,195	\$ 62,301	\$ 1,332,542,696
Covered Payroll.....	\$ 4,341,290	\$ 1,086,962	\$ 567,243,261
See notes to schedule of employer allocations and schedule of pension amounts by employer.			(concluded)

NOTE A – 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 MCRS has elected to use an actuarial based allocation methodology. Accordingly, each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the MCRS'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 on 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 Middlesex Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2018, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the MCRS'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 MCRS have been identified and their total pension liability has been actuarially determined. For transparency purposes, the MCRS 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.

NOTE B – 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.

The following assumption changes were reflected in the January 1, 2024 actuarial valuation.

Changes in Assumptions

- None.

Changes in Plan Provisions

- Effective December 31, 2023, pursuant to chapter 269 of the Acts of 2022, the Board approved a one-time increase in the COLA from 3% to 5% effective July 1, 2022.



**Powers &
Sullivan, LLC**
CPAs AND ADVISORS

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2022

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2022

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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

Opinion

We have audited the accompanying financial statements of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2022, and the related notes to the financial statements, which collectively comprise the MCRS's financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the MCRS as of December 31, 2022, and the changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

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. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the MCRS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management's 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, and for 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.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the MCRS's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a

guarantee that an audit conducted in accordance with generally accepted auditing standards will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform auditing procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit 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 MCRS's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgement, there are conditions or events, considered in the aggregate, that raise substantial doubt about the MCRS's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

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

Other Reporting Required by *Government Auditing Standards*

In accordance with *Government Auditing Standards*, we have also issued our report dated July 20, 2023, on our consideration of the MCRS'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 solely 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 effectiveness of MCRS's 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 MCRS's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of MCRS, 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.

A handwritten signature in black ink, appearing to read "Powers & Sullivan LLC". The signature is written in a cursive, flowing style.

July 20, 2023

Management's Discussion and Analysis

As management of the Middlesex County Retirement System (MCRS), we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2022. The MCRS 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 MCRS's assets exceeded its liabilities at the close of the most recent year by \$1.9 billion (net position).
- The MCRS's net position decreased by \$226.0 million for the year ended December 31, 2022.
- Total investment loss was \$230.6 million; investment expenses were \$9.7 million; and net investment loss was \$240.2 million.
- Total contributions were \$229.4 million, primarily consisting of \$156.4 million from employers, \$54.3 million from members, \$9.0 million in transfers from other systems and \$9.8 million in other contributions.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$211.8 million.
- Depreciation, administrative and building expenses were \$3.4 million.
- The total pension liability was \$3.6 billion as of December 31, 2022, while the net pension liability was \$1.7 billion.
- The Plan fiduciary net position as a percentage of the total pension liability was 52.61%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the MCRS's 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 fiduciary 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 MCRS'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 MCRS's financial position. The MCRS's assets exceeded liabilities by \$1.9 billion at the close of 2022.

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 MCRS's net position included investments of \$1.8 billion, cash of \$31.9 million and current accounts receivable of \$5.5 million. The system also had capital assets, net of accumulated depreciation, of \$4.0 million at year-end primarily consisting of land, an office building, and building improvements.

In 2022, the MCRS's contributions were \$229.4 million while deductions were \$215.2 million which resulted in a current surplus of \$14.2 million. In 2021, the MCRS's contributions were \$214.5 million while deductions were \$201.1 million which resulted in a prior year surplus of \$13.4 million. Therefore, for these two years the MCRS 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. The System experienced a net investment loss of \$240.2 million in 2022, compared to a gain of \$340.2 million in 2021. The annual money weighted rate of return was -11.54% and 19.86% in 2022, and 2021, respectively. The MCRS's investment policy is designed to achieve a long-term rate of return of 7.15% and fluctuation in annual investment returns is expected.

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

	2022	2021
Assets:		
Cash.....	\$ 31,868,459	\$ 18,455,232
Investments.....	1,842,477,278	2,082,386,263
Receivables.....	5,531,048	4,949,242
Capital assets, net of accumulated depreciation....	4,044,658	4,108,907
Total assets.....	1,883,921,443	2,109,899,644
Liabilities:		
Accounts payable.....	127,569	102,089
Other liabilities.....	26,556	26,556
Total liabilities.....	154,125	128,645
Net Position Restricted for Pensions.....	\$ 1,883,767,318	\$ 2,109,770,999

	<u>2022</u>	<u>2021</u>
Additions:		
Contributions:		
Member contributions.....	\$ 54,257,364	\$ 51,747,946
Employer contributions.....	156,421,867	147,955,483
Other contributions.....	<u>18,734,375</u>	<u>14,791,325</u>
Total contributions.....	<u>229,413,606</u>	<u>214,494,754</u>
Net investment income (loss):		
Total investment income (loss).....	(230,563,506)	349,671,539
Less, investment expenses.....	<u>(9,685,400)</u>	<u>(9,428,015)</u>
Net investment income (loss).....	<u>(240,248,906)</u>	<u>340,243,524</u>
Total additions.....	<u>(10,835,300)</u>	<u>554,738,278</u>
Deductions:		
Administration.....	3,024,829	2,878,819
Building operations and maintenance.....	196,641	204,804
Retirement benefits, refunds and transfers.....	211,772,537	197,701,698
Depreciation.....	<u>174,374</u>	<u>320,288</u>
Total deductions.....	<u>215,168,381</u>	<u>201,105,609</u>
Net increase (decrease) in fiduciary net position....	(226,003,681)	353,632,669
Fiduciary net position at beginning of year.....	<u>2,109,770,999</u>	<u>1,756,138,330</u>
Fiduciary net position at end of year.....	\$ <u>1,883,767,318</u>	\$ <u>2,109,770,999</u>

Requests for Information

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

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2022

Assets	
Cash and cash equivalents.....	\$ 31,868,459
Investments:	
Investments in Pension Reserve Investment Trust.....	1,840,310,810
Pooled alternative investments.....	2,165,484
Pooled real estate funds.....	<u>984</u>
Total investments.....	<u>1,842,477,278</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	4,780,456
Member contributions.....	42,035
Member make-up payments and redeposits.....	316,706
Transfers from other systems.....	325,759
Other accounts receivable.....	<u>17,547</u>
Total receivables.....	<u>5,482,503</u>
Interest and dividends.....	48,545
Capital assets, net of accumulated depreciation.....	<u>4,044,658</u>
Total Assets.....	<u>1,883,921,443</u>
Liabilities	
Accounts payable.....	127,569
Other liabilities.....	<u>26,556</u>
Total Liabilities.....	<u>154,125</u>
Net Position Restricted for Pensions.....	\$ <u>1,883,767,318</u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2022

Additions:	
Contributions:	
Employer pension appropriation.....	\$ 156,366,867
Member contributions.....	54,257,364
Transfers from other systems.....	8,992,726
3(8)(c) contributions from other systems.....	8,142,165
Workers' compensation settlements.....	55,000
Retirement benefits - state COLA reimbursements.....	612,144
Members' makeup payments and redeposits.....	906,649
Interest not refunded.....	<u>80,691</u>
 Total contributions.....	 <u>229,413,606</u>
Net investment income (loss):	
Investment income (loss).....	(230,563,506)
Less: investment expense.....	<u>(9,685,400)</u>
 Net investment income (loss).....	 <u>(240,248,906)</u>
 Total additions.....	 <u>(10,835,300)</u>
Deductions:	
Administration.....	3,024,829
Building operations and maintenance.....	196,641
Retirement benefits and refunds.....	194,383,539
Transfers to other systems.....	8,981,784
3(8)(c) transfer to other systems.....	8,407,214
Depreciation.....	<u>174,374</u>
 Total deductions.....	 <u>215,168,381</u>
 Net increase (decrease) in fiduciary net position.....	 (226,003,681)
 Fiduciary net position at beginning of year.....	 <u>2,109,770,999</u>
 Fiduciary net position at end of year.....	 <u>\$ 1,883,767,318</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System (MCRS) is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week and who are paid annual compensation of no less than \$5,000. As of January 1, 2022, the MCRS had 71 participating employers.

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

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

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

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

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

Administrative expenses are paid from investment income.

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

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

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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

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

Cash and Investments

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

Fair Value Measurements

The MCRS 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 MCRS'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 MCRS 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:	12/31/2026
Advisory Council Member.....	Brian P. Curtin	Term Expires:	12/31/2024
Elected Member.....	John Brown	Term Expires:	12/31/2023
Elected Member.....	Joseph W. Kearns	Term Expires:	12/31/2025
Appointed Member.....	Robert W. Healy, Jr.	Term Expires:	12/16/2025

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 MCRS. The Board must annually file a financial statement of condition

for the MCRS with the Executive Director of PERAC.

The investment of the MCRS'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 MCRS has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the MCRS 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
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, 2022, the carrying amount of the MCRS's deposits totaled \$30,386,584, and the bank balance totaled \$33,114,129, all of which was covered by Federal Depository Insurance.

Investments

The MCRS's investments were as follows:

<u>Investment Type</u>	<u>December 31, 2022</u>
PRIT Pooled Funds.....	\$ 1,840,310,810
Money Market Mutual Funds.....	1,481,875
Pooled Alternative Investments...	2,165,484
Pooled Real Estate Funds.....	<u>984</u>
Total Investments.....	<u>\$ 1,843,959,153</u>

Approximately 99.8% of the Retirement MCRS'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. The effective weighted

duration rate for PRIT investments ranged from 1.98 to 14.64 years.

Approximately 0.01% of the MCRS's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 0.01% of the MCRS'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 -11.54%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Value of Investments

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

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

The MCRS had the following recurring fair value measurements as of December 31, 2022:

Investment Type	12/31/2022	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:				
Money Market Mutual Funds.....	\$ 1,481,875	\$ 1,481,875	\$ -	\$ -
Pooled Alternative Investments.....	2,165,484	-	-	2,165,484
Pooled Real Estate Funds.....	984	-	-	984
Total Investments by fair value level.....	3,648,343	\$ 1,481,875	\$ -	\$ 2,166,468
Investments measured at the net asset value (NAV):				
PRIT Investments.....	1,840,310,810			
Total Investments.....	\$ 1,843,959,153			

Money market mutual funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled alternative investments and pooled real estate funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method.

NOTE 6 – CAPITAL ASSETS

All purchases and building costs in excess of \$25,000 are capitalized at the date of acquisition. Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements.....	40
Vehicles.....	5
Software and equipment.....	5

Capital asset activity for the year ended December 31, 2022, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
Construction in progress.....	-	9,375	-	9,375
Total capital assets not being depreciated.....	672,657	9,375	-	682,032
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,099,492	100,750	-	1,200,242
Vehicles.....	30,913	-	(30,913)	-
Software and equipment.....	757,189	-	(729,570)	27,619
Total capital assets being depreciated.....	7,304,730	100,750	(760,483)	6,644,997
<u>Less accumulated depreciation for:</u>				
Buildings.....	(2,577,494)	(135,428)	-	(2,712,922)
Building improvements.....	(521,297)	(29,740)	-	(551,037)
Vehicles.....	(30,912)	-	30,912	-
Software and equipment.....	(738,777)	(9,206)	729,571	(18,412)
Total accumulated depreciation.....	(3,868,480)	(174,374)	760,483	(3,282,371)
Total capital assets being depreciated, net.....	3,436,250	(73,624)	-	3,362,626
Total capital assets, net.....	\$ 4,108,907	\$ (64,249)	\$ -	\$ 4,044,658

NOTE 7 – MEMBERSHIP

The following table represents the MCRS's membership at January 1, 2022:

Active members.....	9,432
Inactive members entitled to a return of their employee contributions.....	3,581
Inactive members with a vested right to a deferred or immediate benefit.....	403
Retirees and beneficiaries currently receiving benefits.....	<u>6,284</u>
Total.....	<u>19,700</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2022, were as follows:

Total pension liability.....	\$ 3,580,828,018
The MCRS's fiduciary net position.....	<u>1,883,767,318</u>
The net pension liability.....	\$ <u>1,697,060,700</u>
The MCRS's fiduciary net position as a percentage of the total pension liability.....	52.61%

The total pension liability was determined by an actuarial valuation as of January 1, 2022, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2022:

Valuation date.....	January 1, 2022.
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.50% for fiscal 2023, through fiscal 2028, and thereafter the remaining unfunded liability will be amortized on a 4.00% annual increasing basis; ERI liability amortized in level payments.
Remaining amortization period.....	17 years from July 1, 2020, for non-ERI liability, and 2 years from July 1, 2020 for 2010 ERI.
Asset valuation method.....	The difference between the expected return and the actual investment return on a fair value basis is recognized over a five year period. Asset value is adjusted as necessary to be within 20% of the fair value.
Investment rate of return/Discount rate..	7.15%.
Inflation rate.....	3.25%.

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.....	3.00% of the first \$16,000 of retirement income.
Mortality Rates:	
Pre-Retirement.....	The RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2021.
Healthy Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2021.
Disabled Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year and projected generationally with Scale MP-2021.

Investment policy: The MCRS'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 MCRS's target asset allocation as of December 31, 2022, are summarized in the following table:

Asset Class	Long-Term Expected Asset Allocation	Long-Term Expected Real Rate of Return
Domestic equity.....	20.50%	6.59%
International developed markets equity.....	12.00%	6.87%
International emerging markets equity.....	4.50%	8.30%
Core fixed income.....	15.00%	1.53%
High-yield fixed income.....	8.00%	3.54%
Real estate.....	10.00%	3.44%
Timber.....	4.00%	4.01%
Hedge funds, GTAA, risk parity.....	10.00%	3.06%
Private equity.....	16.00%	9.49%
	<u>100.00%</u>	

Discount rate: The discount rate used to measure the total pension liability was 7.15% at December 31, 2022, and December 31, 2021. 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 MCRS's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the discount rate: The following presents the net pension liability, calculated using the discount rate of 7.15%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.15%) or 1-percentage-point higher (8.15%) than the current rate:

	1% Decrease (6.15%)	Current Discount (7.15%)	1% Increase (8.15%)
Middlesex County Retirement System's net pension liability as of December 31, 2022.....	\$ 2,100,727,873	\$ 1,697,060,700	\$ 1,357,206,313

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 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

There were no GASB pronouncements required to be implemented in 2022 that impacted the MCRS's financial statements.

None of the issued GASB statements that are required to be implemented in future years are anticipated to impact the MCRS's financial statements.

NOTE 10 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through July 20, 2023, which is the date the financial statements were available to be issued.

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Required Supplementary Information

Middlesex County Retirement System

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Required Supplementary Information

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

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

	December 31, 2018	December 31, 2019	December 31, 2020	December 31, 2021	December 31, 2022
\$	64,615,910	\$ 66,816,001	\$ 73,591,385	\$ 76,097,081	\$ 78,883,633
	208,614,148	216,905,943	229,825,239	238,805,957	245,416,378
	-	29,156,339	-	-	-
	-	46,671,873	-	5,225,766	-
	-	65,013,900	-	27,166,375	-
	<u>(161,259,804)</u>	<u>(168,486,003)</u>	<u>(181,769,445)</u>	<u>(184,028,124)</u>	<u>(193,970,504)</u>
	111,970,254	256,078,053	121,647,179	163,267,055	130,329,507
	<u>2,797,535,970</u>	<u>2,909,506,224</u>	<u>3,165,584,277</u>	<u>3,287,231,456</u>	<u>3,450,498,511</u>
\$	<u>2,909,506,224</u>	<u>3,165,584,277</u>	<u>3,287,231,456</u>	<u>3,450,498,511</u>	<u>3,580,828,018</u>
\$	120,614,676	\$ 129,685,755	\$ 138,290,237	\$ 147,849,683	\$ 156,366,867
	45,984,957	48,445,698	50,973,950	51,747,946	54,257,364
	9,581,643	10,842,796	7,222,913	14,897,125	18,789,375
	(31,074,711)	208,322,511	185,429,727	340,243,524	(240,248,906)
	(2,645,568)	(2,754,384)	(2,781,367)	(2,878,819)	(3,024,829)
	(309,357)	(279,208)	(208,858)	(204,804)	(196,641)
	(161,259,804)	(168,486,003)	(181,769,445)	(184,028,124)	(193,970,504)
	(8,884,478)	(9,969,856)	(6,225,703)	(13,673,574)	(17,802,033)
	<u>(318,812)</u>	<u>(318,812)</u>	<u>(321,386)</u>	<u>(320,288)</u>	<u>(174,374)</u>
	(28,311,454)	215,488,497	190,610,068	353,632,669	(226,003,681)
	<u>1,378,351,219</u>	<u>1,350,039,765</u>	<u>1,565,528,262</u>	<u>1,756,138,330</u>	<u>2,109,770,999</u>
\$	<u>1,350,039,765</u>	<u>1,565,528,262</u>	<u>1,756,138,330</u>	<u>2,109,770,999</u>	<u>1,883,767,318</u>
\$	<u>1,559,466,459</u>	<u>1,600,056,015</u>	<u>1,531,093,126</u>	<u>1,340,727,512</u>	<u>1,697,060,700</u>
	46.40%	49.45%	53.42%	61.14%	52.61%
\$	471,115,185	\$ 492,109,775	\$ 513,201,283	\$ 519,239,589	\$ 541,233,353
	331.02%	325.14%	298.34%	258.21%	313.55%

SCHEDULE OF CONTRIBUTIONS

Year	Actuarially determined contribution	Contributions in relation to the actuarially determined contribution	Contribution deficiency (excess)	Covered payroll	Contributions as a percentage of covered payroll
December 31, 2022	\$ 153,677,331	\$ (156,335,119)	\$ (2,657,788)	\$ 541,233,353	28.88%
December 31, 2021	144,255,207	(147,852,245)	(3,597,038)	519,239,589	28.47%
December 31, 2020	135,472,822	(138,290,237)	(2,817,415)	513,201,283	26.95%
December 31, 2019	127,151,838	(129,685,754)	(2,533,916)	492,109,775	26.35%
December 31, 2018	119,298,291	(120,614,676)	(1,316,385)	471,115,185	25.60%
December 31, 2017	112,017,087	(115,426,815)	(3,409,728)	451,777,105	25.55%
December 31, 2016	105,246,797	(107,067,707)	(1,820,910)	439,644,322	24.35%
December 31, 2015	98,792,642	(99,820,481)	(1,027,839)	432,382,921	23.09%
December 31, 2014	92,826,743	(93,400,946)	(574,203)	415,752,810	22.47%

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

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, 2022.....	-11.54%
December 31, 2021.....	19.86%
December 31, 2020.....	12.26%
December 31, 2019.....	16.21%
December 31, 2018.....	-2.52%
December 31, 2017.....	17.25%
December 31, 2016.....	7.35%
December 31, 2015.....	0.61%
December 31, 2014.....	7.54%

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

See notes to required supplementary information.

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

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

NOTE B – CONTRIBUTIONS

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

NOTE C – MONEY WEIGHTED RATE OF RETURN

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

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONS

The following changes were reflected in the January 1, 2022 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.30% to 7.15%.
- The mortality projection scale was updated from MP-2017 to MP-2021.

Changes in Plan Provisions

- None.

Audit of Specific Elements, Accounts and Items of Financial Statements

Middlesex County Retirement System

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*Audit of Specific Elements Accounts and
Items of Financial Statements*

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Independent Auditor's Report

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

Report on the Audit of the Schedule of Employer Allocations and Schedule of Pension Amounts by Employer

Opinion

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, 2022, 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 contributions and total pension expense included in the accompanying schedule pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2022, and the related notes.

In our opinion, the accompanying schedule of employer allocations and schedule of pension amounts by employer present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflows of resources, total contributions and total pension expense for the total of all participating entities for the MCRS as of and for the year ended December 31, 2022, in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Schedules section of our report. We are required to be independent of the MCRS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Schedules

Management is responsible for the preparation and fair presentation of the schedules in accordance with accounting principles generally accepted in the United States of America and for 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 Responsibilities for the Audit of the Schedules

Our objectives are to obtain reasonable assurance about whether the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer as a whole are free from material

misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the schedules.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the schedules, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the schedules.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purposes of expressing an opinion on the effectiveness of the MCRS's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the schedules.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Other Matter

We have audited, in accordance with GAAS, the financial statements of the MCRS as of and for the year ended December 31, 2022, and our report thereon, dated July 20, 2023, expressed an unmodified opinion on those financial statements.

Restriction on Use

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



July 20, 2023

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2022

Employer	Share of Net Pension Liability/(Asset)	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	56,442,883	3.325920%
Town of Ashby.....	2,195,503	0.129371%
Town of Ashland.....	39,177,494	2.308550%
Town of Ayer.....	21,132,333	1.245231%
Town of Bedford.....	58,143,653	3.426139%
Town of Billerica.....	163,486,989	9.633538%
Town of Boxborough.....	12,627,142	0.744060%
Town of Burlington.....	143,508,193	8.456279%
Town of Carlisle.....	13,493,696	0.795122%
Town of Chelmsford.....	117,848,343	6.944262%
Town of Dracut.....	75,091,196	4.424780%
Town of Dunstable.....	3,248,740	0.191433%
Town of Groton.....	25,150,097	1.481980%
Town of Holliston.....	27,235,114	1.604840%
Town of Hopkinton.....	29,030,303	1.710623%
Town of Hudson.....	75,932,435	4.474350%
Town of Lincoln.....	32,224,079	1.898817%
Town of Littleton.....	30,512,028	1.797934%
Town of North Reading.....	55,154,781	3.250018%
Town of Pepperell.....	19,372,966	1.141560%
Town of Sherborn.....	11,793,029	0.694909%
Town of Shirley.....	10,265,353	0.604890%
Town of Stow.....	14,182,336	0.835700%
Town of Sudbury.....	66,845,536	3.938901%
Town of Tewksbury.....	115,583,007	6.810776%
Town of Townsend.....	7,565,089	0.445776%
Town of Tyngsborough.....	27,541,050	1.622868%
Town of Wayland.....	60,047,515	3.538325%
Town of Westford.....	65,161,824	3.839687%
Town of Weston.....	73,861,876	4.352341%
Town of Wilmington.....	93,568,182	5.513544%
Acton-Boxborough Regional School District.....	32,804,832	1.933038%
Acton Water Supply.....	4,310,937	0.254024%
Bedford Housing Authority.....	357,375	0.021058%
Billerica Housing Authority.....	1,270,401	0.074859%
Chelmsford Housing Authority.....	2,873,470	0.169320%
Chelmsford Water District.....	819,895	0.048313%
Dracut Housing Authority.....	1,967,855	0.115957%
Dracut Water Supply.....	3,773,011	0.222326%

(Continued)

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2022

Employer	Share of Net Pension Liability/(Asset)	Percent of Total Net Pension Liability
East Chelmsford Water District.....	358,607	0.021131%
East Middlesex Mosquito Control.....	843,725	0.049717%
Greater Lowell Regional Vocational Technical School District.....	20,251,238	1.193313%
Groton-Dunstable Regional School District.....	14,947,853	0.880808%
Hudson Housing Authority.....	807,927	0.047607%
Lincoln-Sudbury Regional School District.....	10,259,862	0.604567%
Nashoba Valley Technical High School District.....	3,773,754	0.222370%
North Chelmsford Water District.....	1,229,309	0.072438%
North Middlesex Regional School District.....	14,660,062	0.863850%
Shawsheen Valley Regional Vocational School.....	9,786,464	0.576671%
South Middlesex Regional Vocational Technical School.....	7,705,068	0.454024%
Sudbury Water District.....	2,303,019	0.135706%
Tewksbury Housing Authority.....	1,805,120	0.106367%
Wayland Housing Authority.....	671,550	0.039571%
Hopkinton Housing Authority.....	591,913	0.034879%
Sudbury Housing Authority.....	534,374	0.031488%
Wilmington Housing Authority.....	233,342	0.013750%
Acton Housing Authority.....	1,015,501	0.059839%
Burlington Housing Authority.....	198,080	0.011672%
Ayer Housing Authority.....	753,718	0.044413%
Holliston Housing Authority.....	159,405	0.009393%
Littleton Housing Authority.....	660,639	0.038928%
Westford Housing Authority.....	456,630	0.026907%
Shirley Water District.....	558,390	0.032903%
Tyngsborough Housing Authority.....	577,242	0.034014%
Pepperell Housing Authority.....	248,169	0.014623%
Groton Housing Authority.....	-	0.000000%
Tyngsborough Water District.....	597,899	0.035231%
North Reading Housing Authority.....	65,307	0.003848%
West Groton Water.....	76,911	0.004532%
Ayer-Shirley Regional School District.....	4,746,593	0.279695%
Northern Middlesex Regional Emergency Communications Center.....	582,488	0.034323%
Total.....	\$ 1,697,060,700	100.000%

(Concluded)

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

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2022

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 44,317,853
Ending net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 56,442,883
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 414,738
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	4,537,806
Changes of assumptions.....	-	-	-	974,581
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	207,080
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 6,134,205
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ -	\$ -	\$ -	\$ 1,314,946
Pension Expense				
Proportionate share of plan pension expense.....	\$ 459,165	\$ -	\$ -	\$ 5,874,434
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(403,636)
Total Employer Pension Expense.....	\$ 459,165	\$ -	\$ -	\$ 5,470,798
Contributions				
Statutory required contribution.....	\$ 459,165	\$ -	\$ -	\$ 5,133,300
Contribution in relation to statutory required contribution.....	(459,165)	-	-	(5,137,366)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (4,066)
Contributions as a percentage of covered payroll.....	32.93%	N/A	N/A	33.00%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ -	\$ -	\$ -	\$ 552,537
June 30, 2025.....	-	-	-	557,660
June 30, 2026.....	-	-	-	1,051,940
June 30, 2027.....	-	-	-	2,657,122
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 4,819,259
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ -	\$ -	\$ -	\$ 69,868,529
Current discount rate (7.15%).....	\$ -	\$ -	\$ -	\$ 56,442,883
1% increase (8.15%).....	\$ -	\$ -	\$ -	\$ 45,139,600
Covered Payroll.....	\$ 1,394,225	\$ -	\$ -	\$ 15,565,493
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, 2022

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 1,370,949	\$ 29,025,102	\$ 16,034,552	\$ 44,033,584
Ending net pension liability/(asset).....	\$ 2,195,503	\$ 39,177,494	\$ 21,132,333	\$ 58,143,653
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 16,132	\$ 287,872	\$ 155,278	\$ 427,234
Net difference between projected and actual investment earnings on pension plan investments.....	176,511	3,149,734	1,698,966	4,674,547
Changes of assumptions.....	37,909	676,465	364,885	1,003,948
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	371,518	2,019,412	926,380	1,658,100
Total Deferred Outflows of Resources.....	\$ 602,070	\$ 6,133,483	\$ 3,145,509	\$ 7,763,829
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 107,000	\$ 1,473,803	\$ 292,260	\$ 1,140,018
Pension Expense				
Proportionate share of plan pension expense.....	\$ 228,502	\$ 4,077,493	\$ 2,199,400	\$ 6,051,441
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	70,148	228,168	155,921	(159,982)
Total Employer Pension Expense.....	\$ 298,650	\$ 4,303,661	\$ 2,355,321	\$ 5,891,459
Contributions				
Statutory required contribution.....	\$ 253,936	\$ 3,793,010	\$ 2,058,373	\$ 5,288,347
Contribution in relation to statutory required contribution.....	(253,936)	(3,838,105)	(2,358,373)	(5,288,347)
Contribution deficiency/(excess).....	\$ -	\$ (45,095)	\$ (300,000)	\$ -
Contributions as a percentage of covered payroll.....	24.40%	23.82%	30.91%	25.93%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 73,090	\$ 754,846	\$ 450,870	\$ 745,810
June 30, 2025.....	106,446	627,183	509,871	1,107,515
June 30, 2026.....	122,489	990,852	685,956	1,672,098
June 30, 2027.....	193,045	2,286,799	1,206,552	3,098,388
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 495,070	\$ 4,659,680	\$ 2,853,249	\$ 6,623,811
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 2,717,731	\$ 48,496,352	\$ 26,158,923	\$ 71,973,850
Current discount rate (7.15%).....	\$ 2,195,503	\$ 39,177,494	\$ 21,132,333	\$ 58,143,653
1% increase (8.15%).....	\$ 1,755,830	\$ 31,331,786	\$ 16,900,359	\$ 46,499,770
Covered Payroll.....	\$ 1,040,863	\$ 16,112,007	\$ 7,630,394	\$ 20,395,777
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2022

	Town of BillERICA	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 136,486,741	\$ 10,220,882	\$ 118,806,981	\$ 8,806,565
Ending net pension liability/(asset).....	\$ 163,486,989	\$ 12,627,142	\$ 143,508,193	\$ 13,493,696
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,201,286	\$ 92,783	\$ 1,054,484	\$ 99,150
Net difference between projected and actual investment earnings on pension plan investments.....	13,143,783	1,015,178	11,537,558	1,084,846
Changes of assumptions.....	2,822,878	218,029	2,477,910	232,991
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,947,082	185,836	1,690,322	1,677,908
Total Deferred Outflows of Resources.....	\$ 19,115,029	\$ 1,511,826	\$ 16,760,274	\$ 3,094,895
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 6,976,688	\$ 456,577	\$ 5,365,368	\$ 139,850
Pension Expense				
Proportionate share of plan pension expense.....	\$ 17,015,293	\$ 1,314,203	\$ 14,935,963	\$ 1,404,390
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,445,252)	34,085	(438,191)	484,217
Total Employer Pension Expense.....	\$ 15,570,041	\$ 1,348,288	\$ 14,497,772	\$ 1,888,607
Contributions				
Statutory required contribution.....	\$ 14,484,999	\$ 1,218,757	\$ 12,543,435	\$ 1,265,339
Contribution in relation to statutory required contribution.....	(14,484,999)	(1,218,757)	(12,543,435)	(1,265,339)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.29%	33.08%	32.30%	19.74%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 1,958,008	\$ 251,180	\$ 2,363,597	\$ 567,842
June 30, 2025.....	1,584,707	86,155	1,309,424	601,700
June 30, 2026.....	2,793,370	178,035	2,439,008	743,169
June 30, 2027.....	5,802,256	539,879	5,282,877	1,042,334
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 12,138,341	\$ 1,055,249	\$ 11,394,906	\$ 2,955,045
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 202,374,420	\$ 15,630,666	\$ 177,643,417	\$ 16,703,341
Current discount rate (7.15%).....	\$ 163,486,989	\$ 12,627,142	\$ 143,508,193	\$ 13,493,696
1% increase (8.15%).....	\$ 130,746,987	\$ 10,098,423	\$ 114,769,157	\$ 10,791,440
Covered Payroll.....	\$ 39,914,881	\$ 3,684,081	\$ 38,832,472	\$ 6,411,108
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, 2022

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 100,318,386	\$ 62,185,294	\$ 2,299,674	\$ 19,238,916
Ending net pension liability/(asset).....	\$ 117,848,343	\$ 75,091,196	\$ 3,248,740	\$ 25,150,097
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 865,938	\$ 551,763	\$ 23,871	\$ 184,800
Net difference between projected and actual investment earnings on pension plan investments.....	9,474,595	6,037,070	261,187	2,021,980
Changes of assumptions.....	2,034,850	1,296,576	56,095	434,259
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,148,173	2,635,063	379,965	1,031,430
Total Deferred Outflows of Resources.....	\$ 14,523,556	\$ 10,520,472	\$ 721,118	\$ 3,672,469
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 6,194,852	\$ 2,823,620	\$ 286,971	\$ 1,415,151
Pension Expense				
Proportionate share of plan pension expense.....	\$ 12,265,352	\$ 7,815,297	\$ 338,122	\$ 2,617,557
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,247,255)	231,400	64,039	7,889
Total Employer Pension Expense.....	\$ 11,018,097	\$ 8,046,697	\$ 402,161	\$ 2,625,446
Contributions				
Statutory required contribution.....	\$ 10,538,132	\$ 6,554,393	\$ 389,434	\$ 2,538,910
Contribution in relation to statutory required contribution.....	(11,142,487)	(6,564,528)	(389,434)	(2,538,910)
Contribution deficiency/(excess).....	\$ (604,355)	\$ (10,135)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	35.63%	36.40%	26.06%	29.53%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 1,331,980	\$ 1,643,026	\$ 97,584	\$ 421,870
June 30, 2025.....	1,128,363	1,369,809	45,270	143,763
June 30, 2026.....	1,977,293	1,923,774	63,477	344,128
June 30, 2027.....	3,891,068	2,760,243	227,816	1,347,557
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 8,328,704	\$ 7,696,852	\$ 434,147	\$ 2,257,318
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 145,880,050	\$ 92,952,579	\$ 4,021,494	\$ 31,132,363
Current discount rate (7.15%).....	\$ 117,848,343	\$ 75,091,196	\$ 3,248,740	\$ 25,150,097
1% increase (8.15%).....	\$ 94,247,964	\$ 60,053,388	\$ 2,598,145	\$ 20,113,524
Covered Payroll.....	\$ 31,275,996	\$ 18,032,108	\$ 1,494,204	\$ 8,598,720
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, 2022

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 18,170,200	\$ 16,725,088	\$ 59,893,267	\$ 24,515,962
Ending net pension liability/(asset).....	\$ 27,235,114	\$ 29,030,303	\$ 75,932,435	\$ 32,224,079
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 200,121	\$ 213,312	\$ 557,944	\$ 236,779
Net difference between projected and actual investment earnings on pension plan investments.....	2,189,608	2,333,935	6,104,703	2,590,703
Changes of assumptions.....	470,260	501,257	1,311,101	556,403
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,193,932	5,987,713	1,236,905	1,526,663
Total Deferred Outflows of Resources.....	\$ 6,053,921	\$ 9,036,217	\$ 9,210,653	\$ 4,910,548
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 2,569,699	\$ 2,566,478	\$ 394,803	\$ 128,696
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,834,562	\$ 3,021,398	\$ 7,902,854	\$ 3,353,800
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	5,102	1,132,408	110,029	407,326
Total Employer Pension Expense.....	\$ 2,839,664	\$ 4,153,806	\$ 8,012,883	\$ 3,761,126
Contributions				
Statutory required contribution.....	\$ 2,754,852	\$ 3,087,462	\$ 6,794,331	\$ 2,754,456
Contribution in relation to statutory required contribution.....	(2,754,852)	(3,142,328)	(6,794,331)	(2,754,456)
Contribution deficiency/(excess).....	\$ -	\$ (54,866)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	22.66%	16.26%	28.48%	23.20%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 250,366	\$ 1,147,496	\$ 1,367,997	\$ 886,128
June 30, 2025.....	441,345	1,075,166	1,661,806	980,269
June 30, 2026.....	736,878	1,424,169	2,295,732	1,258,575
June 30, 2027.....	2,055,633	2,822,908	3,490,315	1,656,880
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 3,484,222	\$ 6,469,739	\$ 8,815,850	\$ 4,781,852
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 33,713,327	\$ 35,935,525	\$ 93,993,917	\$ 39,888,980
Current discount rate (7.15%).....	\$ 27,235,114	\$ 29,030,303	\$ 75,932,435	\$ 32,224,079
1% increase (8.15%).....	\$ 21,780,994	\$ 23,216,677	\$ 60,726,160	\$ 25,770,866
Covered Payroll.....	\$ 12,158,151	\$ 19,323,845	\$ 23,852,808	\$ 11,870,539
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, 2022

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 19,636,977	\$ 44,566,036	\$ 15,377,884	\$ 8,564,819
Ending net pension liability/(asset).....	\$ 30,512,028	\$ 55,154,781	\$ 19,372,966	\$ 11,793,029
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 224,199	\$ 405,272	\$ 142,351	\$ 86,654
Net difference between projected and actual investment earnings on pension plan investments.....	2,453,061	4,434,252	1,557,519	948,118
Changes of assumptions.....	526,841	952,340	334,507	203,626
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,795,271	292,029	12,980	751,329
Total Deferred Outflows of Resources.....	\$ 7,999,372	\$ 6,083,893	\$ 2,047,357	\$ 1,989,727
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 106,404	\$ 1,331,593	\$ 104,629	\$ 240,975
Pension Expense				
Proportionate share of plan pension expense.....	\$ 3,175,613	\$ 5,740,368	\$ 2,016,288	\$ 1,227,390
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,693,128	(550,297)	(49,078)	(1,782)
Total Employer Pension Expense.....	\$ 4,868,741	\$ 5,190,071	\$ 1,967,210	\$ 1,225,608
Contributions				
Statutory required contribution.....	\$ 2,900,040	\$ 4,854,543	\$ 1,811,124	\$ 1,112,907
Contribution in relation to statutory required contribution.....	(2,900,040)	(4,854,543)	(1,811,897)	(1,112,907)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (773)	\$ -
Contributions as a percentage of covered payroll.....	18.63%	32.98%	31.69%	23.05%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 1,868,762	\$ 509,620	\$ 292,199	\$ 154,987
June 30, 2025.....	1,644,423	754,409	305,096	389,386
June 30, 2026.....	1,953,292	1,206,384	460,937	486,024
June 30, 2027.....	2,426,491	2,281,887	884,496	718,355
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 7,892,968	\$ 4,752,300	\$ 1,942,728	\$ 1,748,752
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 37,769,697	\$ 68,274,037	\$ 23,981,069	\$ 14,598,149
Current discount rate (7.15%).....	\$ 30,512,028	\$ 55,154,781	\$ 19,372,966	\$ 11,793,029
1% increase (8.15%).....	\$ 24,401,671	\$ 44,109,452	\$ 15,493,324	\$ 9,431,350
Covered Payroll.....	\$ 15,569,164	\$ 14,719,205	\$ 5,718,227	\$ 4,827,222
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, 2022

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 8,630,720	\$ 11,352,166	\$ 54,643,133	\$ 99,361,547
Ending net pension liability/(asset).....	\$ 10,265,353	\$ 14,182,336	\$ 66,845,536	\$ 115,583,007
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 75,429	\$ 104,210	\$ 491,174	\$ 849,292
Net difference between projected and actual investment earnings on pension plan investments.....	825,299	1,140,210	5,374,148	9,292,470
Changes of assumptions.....	177,249	244,882	1,154,201	1,995,735
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	479,297	843,765	220,897	4,834,589
Total Deferred Outflows of Resources.....	\$ 1,557,274	\$ 2,333,067	\$ 7,240,420	\$ 16,972,086
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 526,796	\$ 263,882	\$ 2,033,590	\$ 7,852,508
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,068,390	\$ 1,476,061	\$ 6,957,113	\$ 12,029,582
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	30,692	231,096	(836,453)	(849,179)
Total Employer Pension Expense.....	\$ 1,099,082	\$ 1,707,157	\$ 6,120,660	\$ 11,180,403
Contributions				
Statutory required contribution.....	\$ 866,303	\$ 1,147,938	\$ 5,993,875	\$ 9,788,110
Contribution in relation to statutory required contribution.....	(866,303)	(1,151,354)	(5,993,875)	(9,792,941)
Contribution deficiency/(excess).....	\$ -	\$ (3,416)	\$ -	\$ (4,831)
Contributions as a percentage of covered payroll.....	42.63%	28.89%	30.57%	38.10%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 208,619	\$ 452,542	\$ 515,805	\$ 1,703,873
June 30, 2025.....	200,965	452,474	756,668	1,607,898
June 30, 2026.....	278,752	572,794	1,287,686	2,435,719
June 30, 2027.....	342,142	591,375	2,646,671	3,372,088
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,030,478	\$ 2,069,185	\$ 5,206,830	\$ 9,119,578
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 12,707,096	\$ 17,555,783	\$ 82,745,585	\$ 143,075,875
Current discount rate (7.15%).....	\$ 10,265,353	\$ 14,182,336	\$ 66,845,536	\$ 115,583,007
1% increase (8.15%).....	\$ 8,209,607	\$ 11,342,173	\$ 53,459,009	\$ 92,436,285
Covered Payroll.....	\$ 2,031,952	\$ 3,984,650	\$ 19,605,695	\$ 25,701,352
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, 2022

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 4,774,763	\$ 21,175,029	\$ 46,247,117	\$ 44,844,218
Ending net pension liability/(asset).....	\$ 7,565,089	\$ 27,541,050	\$ 60,047,515	\$ 65,161,824
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 55,588	\$ 202,369	\$ 441,223	\$ 478,803
Net difference between projected and actual investment earnings on pension plan investments.....	608,207	2,214,204	4,827,611	5,238,783
Changes of assumptions.....	130,624	475,543	1,036,821	1,125,128
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,324,158	995,898	1,236,272	6,153,864
Total Deferred Outflows of Resources.....	\$ 2,118,577	\$ 3,888,014	\$ 7,541,927	\$ 12,996,578
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,465,660	\$ -	\$ 2,300,846	\$ 2,660,667
Pension Expense				
Proportionate share of plan pension expense.....	\$ 787,355	\$ 2,866,401	\$ 6,249,592	\$ 6,781,875
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(152,213)	503,300	(583,558)	1,006,258
Total Employer Pension Expense.....	\$ 635,142	\$ 3,369,701	\$ 5,666,034	\$ 7,788,133
Contributions				
Statutory required contribution.....	\$ 991,340	\$ 2,617,413	\$ 5,728,625	\$ 6,263,082
Contribution in relation to statutory required contribution.....	(995,268)	(2,617,413)	(5,728,625)	(6,263,082)
Contribution deficiency/(excess).....	\$ (3,928)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	26.39%	27.73%	25.94%	22.55%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ (104,111)	\$ 891,257	\$ 390,481	\$ 1,625,808
June 30, 2025.....	10,250	678,158	621,507	1,770,040
June 30, 2026.....	68,906	899,445	1,148,282	2,393,781
June 30, 2027.....	677,872	1,419,154	3,080,811	4,546,282
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 652,917	\$ 3,888,014	\$ 5,241,081	\$ 10,335,911
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 9,364,540	\$ 34,092,034	\$ 74,330,570	\$ 80,661,381
Current discount rate (7.15%).....	\$ 7,565,089	\$ 27,541,050	\$ 60,047,515	\$ 65,161,824
1% increase (8.15%).....	\$ 6,050,100	\$ 22,025,663	\$ 48,022,364	\$ 52,112,478
Covered Payroll.....	\$ 3,771,576	\$ 9,438,696	\$ 22,086,979	\$ 27,779,314
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, 2022

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 59,360,735	\$ 76,302,617	\$ 24,866,009	\$ 3,246,366
Ending net pension liability/(asset).....	\$ 73,861,876	\$ 93,568,182	\$ 32,804,832	\$ 4,310,937
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 542,730	\$ 687,530	\$ 241,047	\$ 31,676
Net difference between projected and actual investment earnings on pension plan investments.....	5,938,237	7,522,555	2,637,384	346,584
Changes of assumptions.....	1,275,349	1,615,612	566,431	74,436
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,388,919	1,005,426	1,372,957	98,843
Total Deferred Outflows of Resources.....	\$ 9,145,235	\$ 10,831,123	\$ 4,817,829	\$ 551,539
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,520,935	\$ 1,151,190	\$ 779,514	\$ 64,378
Pension Expense				
Proportionate share of plan pension expense.....	\$ 7,687,354	\$ 9,738,336	\$ 3,414,241	\$ 448,671
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(182,103)	(197,170)	257,532	(26,785)
Total Employer Pension Expense.....	\$ 7,505,251	\$ 9,541,166	\$ 3,671,773	\$ 421,886
Contributions				
Statutory required contribution.....	\$ 6,288,908	\$ 8,322,908	\$ 3,320,479	\$ 288,240
Contribution in relation to statutory required contribution.....	(6,288,908)	(9,828,234)	(3,320,479)	(288,240)
Contribution deficiency/(excess).....	\$ -	\$ (1,505,326)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	27.75%	37.39%	21.71%	22.24%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 1,193,660	\$ 1,653,373	\$ 756,856	\$ 55,158
June 30, 2025.....	1,358,949	1,611,137	613,779	82,832
June 30, 2026.....	1,986,554	2,381,706	857,148	136,104
June 30, 2027.....	3,085,137	4,033,717	1,810,532	213,067
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 7,624,300	\$ 9,679,933	\$ 4,038,315	\$ 487,161
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 91,430,850	\$ 115,824,548	\$ 40,607,873	\$ 5,336,347
Current discount rate (7.15%).....	\$ 73,861,876	\$ 93,568,182	\$ 32,804,832	\$ 4,310,937
1% increase (8.15%).....	\$ 59,070,253	\$ 74,830,162	\$ 26,235,317	\$ 3,447,626
Covered Payroll.....	\$ 22,665,622	\$ 26,288,985	\$ 15,291,181	\$ 1,296,052
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, 2022

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 255,587	\$ 1,042,229	\$ 1,656,493	\$ (1,005,744)
Ending net pension liability/(asset).....	\$ 357,375	\$ 1,270,401	\$ 2,873,470	\$ 819,895
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,626	\$ 9,335	\$ 21,114	\$ 6,025
Net difference between projected and actual investment earnings on pension plan investments.....	28,732	102,136	231,017	65,917
Changes of assumptions.....	6,171	21,936	49,615	14,157
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	22,292	26,222	648,512	1,477,736
Total Deferred Outflows of Resources.....	\$ 59,821	\$ 159,629	\$ 950,258	\$ 1,563,835
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 17,243	\$ 262,281	\$ 74,288	\$ 748,490
Pension Expense				
Proportionate share of plan pension expense.....	\$ 37,194	\$ 132,219	\$ 299,064	\$ 85,333
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,289)	(70,296)	158,795	202,343
Total Employer Pension Expense.....	\$ 35,905	\$ 61,923	\$ 457,859	\$ 287,676
Contributions				
Statutory required contribution.....	\$ 30,802	\$ 136,975	\$ 268,910	\$ 74,907
Contribution in relation to statutory required contribution.....	(30,802)	(136,975)	(388,910)	(74,907)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (120,000)	\$ -
Contributions as a percentage of covered payroll.....	24.49%	34.09%	12.08%	4.66%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 4,376	\$ (38,778)	\$ 174,186	\$ 78,741
June 30, 2025.....	6,213	(63,829)	184,764	138,012
June 30, 2026.....	9,919	(54,124)	222,255	191,312
June 30, 2027.....	22,070	54,079	294,765	407,280
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 42,578	\$ (102,652)	\$ 875,970	\$ 815,345
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 442,381	\$ 1,572,582	\$ 3,556,961	\$ 1,014,917
Current discount rate (7.15%).....	\$ 357,375	\$ 1,270,401	\$ 2,873,470	\$ 819,895
1% increase (8.15%).....	\$ 285,807	\$ 1,015,990	\$ 2,298,027	\$ 655,702
Covered Payroll.....	\$ 125,795	\$ 401,772	\$ 3,220,111	\$ 1,605,725
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, 2022

	Dracut Housing Authority	Dracut Water Supply	East Cheimsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 1,703,681	\$ 3,204,541	\$ 183,163	\$ 465,506
Ending net pension liability/(asset).....	\$ 1,967,855	\$ 3,773,011	\$ 358,607	\$ 843,725
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 14,460	\$ 27,724	\$ 2,635	\$ 6,200
Net difference between projected and actual investment earnings on pension plan investments.....	158,209	303,337	28,831	67,833
Changes of assumptions.....	33,978	65,147	6,192	14,568
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	9,574	191,934	96,220	171,407
Total Deferred Outflows of Resources.....	\$ 216,221	\$ 588,142	\$ 133,878	\$ 260,008
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 333,536	\$ 278,749	\$ 87,606	\$ 81,841
Pension Expense				
Proportionate share of plan pension expense.....	\$ 204,809	\$ 392,685	\$ 37,323	\$ 87,813
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(113,215)	(39,195)	880	32,399
Total Employer Pension Expense.....	\$ 91,594	\$ 353,490	\$ 38,203	\$ 120,212
Contributions				
Statutory required contribution.....	\$ 182,577	\$ 270,657	\$ 40,049	\$ 62,459
Contribution in relation to statutory required contribution.....	(182,577)	(270,657)	(40,049)	(62,459)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	42.48%	41.41%	17.88%	15.11%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ (57,619)	\$ 49,008	\$ 1,198	\$ 30,319
June 30, 2025.....	(66,626)	58,221	(14)	26,137
June 30, 2026.....	(50,969)	93,188	4,733	40,841
June 30, 2027.....	57,899	108,976	40,355	80,870
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (117,315)	\$ 309,393	\$ 46,272	\$ 178,167
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 2,435,934	\$ 4,670,469	\$ 443,906	\$ 1,044,416
Current discount rate (7.15%).....	\$ 1,967,855	\$ 3,773,011	\$ 358,607	\$ 843,725
1% increase (8.15%).....	\$ 1,573,771	\$ 3,017,426	\$ 286,792	\$ 674,760
Covered Payroll.....	\$ 429,781	\$ 653,666	\$ 223,976	\$ 413,420
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, 2022

	Greater Lowell Regional Vocational Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 17,260,795	\$ 11,406,839	\$ 568,228	\$ 8,307,816
Ending net pension liability/(asset).....	\$ 20,251,238	\$ 14,947,853	\$ 807,927	\$ 10,259,862
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 148,804	\$ 109,835	\$ 5,937	\$ 75,388
Net difference between projected and actual investment earnings on pension plan investments.....	1,628,129	1,201,755	64,955	824,857
Changes of assumptions.....	349,672	258,100	13,950	177,154
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,013,137	667,171	69,930	370,017
Total Deferred Outflows of Resources.....	\$ 3,139,742	\$ 2,236,861	\$ 154,772	\$ 1,447,416
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,397,430	\$ 55,196	\$ 94,619	\$ 373,588
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,107,697	\$ 1,555,734	\$ 84,087	\$ 1,067,820
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	8,640	301,037	(78,268)	(50,131)
Total Employer Pension Expense.....	\$ 2,116,337	\$ 1,856,771	\$ 5,819	\$ 1,017,689
Contributions				
Statutory required contribution.....	\$ 1,553,947	\$ 1,250,129	\$ 62,228	\$ 808,324
Contribution in relation to statutory required contribution.....	(1,554,944)	(1,250,129)	(62,228)	(808,324)
Contribution deficiency/(excess).....	\$ (997)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	31.57%	28.42%	14.01%	25.90%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 426,190	\$ 474,719	\$ (59,088)	\$ 151,452
June 30, 2025.....	270,959	399,379	29,585	212,777
June 30, 2026.....	453,376	552,228	39,102	308,014
June 30, 2027.....	591,787	755,339	50,554	401,585
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,742,312	\$ 2,181,665	\$ 60,153	\$ 1,073,828
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 25,068,249	\$ 18,503,387	\$ 1,000,103	\$ 12,700,299
Current discount rate (7.15%).....	\$ 20,251,238	\$ 14,947,853	\$ 807,927	\$ 10,259,862
1% increase (8.15%).....	\$ 16,195,713	\$ 11,954,387	\$ 646,131	\$ 8,205,216
Covered Payroll.....	\$ 4,925,006	\$ 4,398,476	\$ 444,259	\$ 3,120,449
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, 2022

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 3,439,271	\$ 628,790	\$ 11,254,512	\$ 8,099,773
Ending net pension liability/(asset).....	\$ 3,773,754	\$ 1,229,309	\$ 14,660,062	\$ 9,786,464
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 27,729	\$ 9,033	\$ 107,721	\$ 71,910
Net difference between projected and actual investment earnings on pension plan investments.....	303,397	98,832	1,178,618	786,798
Changes of assumptions.....	65,160	21,226	253,131	168,980
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	185,092	283,324	288,633	330,749
Total Deferred Outflows of Resources.....	\$ 561,378	\$ 412,415	\$ 1,828,103	\$ 1,358,437
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 407,788	\$ 180,580	\$ 18,442	\$ 422,464
Pension Expense				
Proportionate share of plan pension expense.....	\$ 392,763	\$ 127,944	\$ 1,525,780	\$ 1,018,549
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(81,663)	22,318	101,664	(19,139)
Total Employer Pension Expense.....	\$ 311,100	\$ 150,262	\$ 1,627,444	\$ 999,410
Contributions				
Statutory required contribution.....	\$ 348,527	\$ 84,480	\$ 1,299,482	\$ 787,076
Contribution in relation to statutory required contribution.....	(348,527)	(84,480)	(1,299,482)	(787,076)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	32.13%	14.08%	21.54%	25.45%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 23,653	\$ 24,649	\$ 328,913	\$ 175,935
June 30, 2025.....	20,021	28,133	304,121	184,497
June 30, 2026.....	37,869	51,478	436,182	248,448
June 30, 2027.....	72,247	127,575	740,445	347,093
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 153,590	\$ 231,835	\$ 1,809,661	\$ 935,973
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 4,671,389	\$ 1,521,716	\$ 18,147,142	\$ 12,114,297
Current discount rate (7.15%).....	\$ 3,773,754	\$ 1,229,309	\$ 14,660,062	\$ 9,786,464
1% increase (8.15%).....	\$ 3,018,020	\$ 983,127	\$ 11,724,229	\$ 7,826,621
Covered Payroll.....	\$ 1,084,851	\$ 600,183	\$ 6,031,624	\$ 3,092,314
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, 2022

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 6,194,749	\$ 1,399,802	\$ 1,475,444	\$ 371,407
Ending net pension liability/(asset).....	\$ 7,705,068	\$ 2,303,019	\$ 1,805,120	\$ 671,550
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 56,616	\$ 16,922	\$ 13,264	\$ 4,934
Net difference between projected and actual investment earnings on pension plan investments.....	619,461	185,155	145,125	53,990
Changes of assumptions.....	133,041	39,765	31,168	11,595
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	177,684	430,390	16,066	142,300
Total Deferred Outflows of Resources.....	\$ 986,802	\$ 672,232	\$ 205,623	\$ 212,819
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 240,275	\$ 532,380	\$ 60,916	\$ 131,258
Pension Expense				
Proportionate share of plan pension expense.....	\$ 801,924	\$ 239,694	\$ 187,872	\$ 69,896
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(39,484)	(1,784)	(12,743)	(11,243)
Total Employer Pension Expense.....	\$ 762,440	\$ 237,910	\$ 175,129	\$ 58,653
Contributions				
Statutory required contribution.....	\$ 619,647	\$ 192,116	\$ 152,028	\$ 61,744
Contribution in relation to statutory required contribution.....	(619,647)	(192,116)	(152,028)	(61,744)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	26.49%	18.49%	30.10%	17.85%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 85,798	\$ 16,878	\$ 22,720	\$ (6,802)
June 30, 2025.....	136,363	(55,209)	17,215	5,425
June 30, 2026.....	210,348	(18,019)	35,233	15,366
June 30, 2027.....	314,018	196,202	69,539	86,572
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 746,527	\$ 139,852	\$ 144,707	\$ 81,561
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 9,537,815	\$ 2,850,821	\$ 2,234,490	\$ 831,287
Current discount rate (7.15%).....	\$ 7,705,068	\$ 2,303,019	\$ 1,805,120	\$ 671,550
1% increase (8.15%).....	\$ 6,162,046	\$ 1,841,815	\$ 1,443,626	\$ 537,065
Covered Payroll.....	\$ 2,339,395	\$ 1,039,289	\$ 505,022	\$ 345,987
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, 2022

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 498,319	\$ 458,401	\$ 185,577	\$ 721,454
Ending net pension liability/(asset).....	\$ 591,913	\$ 534,374	\$ 233,342	\$ 1,015,501
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 4,349	\$ 3,927	\$ 1,715	\$ 7,462
Net difference between projected and actual investment earnings on pension plan investments.....	47,588	42,962	18,760	81,643
Changes of assumptions.....	10,220	9,227	4,029	17,534
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	25,052	30,438	15,528	67,574
Total Deferred Outflows of Resources.....	\$ 87,209	\$ 86,554	\$ 40,032	\$ 174,213
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 34,752	\$ 37,017	\$ 86,313	\$ 30,654
Pension Expense				
Proportionate share of plan pension expense.....	\$ 61,606	\$ 55,615	\$ 24,287	\$ 105,691
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,109	(693)	(23,288)	15,858
Total Employer Pension Expense.....	\$ 62,715	\$ 54,922	\$ 999	\$ 121,549
Contributions				
Statutory required contribution.....	\$ 46,820	\$ 46,012	\$ 37,810	\$ 81,483
Contribution in relation to statutory required contribution.....	(46,820)	(46,012)	(37,810)	(81,483)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.28%	28.12%	57.22%	16.37%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 10,034	\$ 8,881	\$ (19,043)	\$ 26,507
June 30, 2025.....	8,936	9,894	(21,076)	21,178
June 30, 2026.....	14,534	14,805	(19,933)	33,296
June 30, 2027.....	18,953	15,957	13,771	82,578
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 52,457	\$ 49,537	\$ (46,281)	\$ 143,559
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 732,707	\$ 661,482	\$ 288,845	\$ 1,257,051
Current discount rate (7.15%).....	\$ 591,913	\$ 534,374	\$ 233,342	\$ 1,015,501
1% increase (8.15%).....	\$ 473,376	\$ 427,360	\$ 186,613	\$ 812,136
Covered Payroll.....	\$ 129,068	\$ 163,618	\$ 66,080	\$ 497,848
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, 2022

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 4,057	\$ 691,363	\$ 93,451	\$ 665,340
Ending net pension liability/(asset).....	\$ 198,080	\$ 753,718	\$ 159,405	\$ 660,639
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,455	\$ 5,538	\$ 1,171	\$ 4,854
Net difference between projected and actual investment earnings on pension plan investments.....	15,925	60,596	12,816	53,113
Changes of assumptions.....	3,420	13,014	2,752	11,407
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	183,083	7,985	37,101	96,126
Total Deferred Outflows of Resources.....	\$ 203,883	\$ 87,133	\$ 53,840	\$ 165,500
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 180,433	\$ 130,815	\$ 31,374	\$ 135,424
Pension Expense				
Proportionate share of plan pension expense.....	\$ 20,616	\$ 78,446	\$ 16,590	\$ 68,758
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	21,174	(38,436)	2,562	7,598
Total Employer Pension Expense.....	\$ 41,790	\$ 40,010	\$ 19,152	\$ 76,356
Contributions				
Statutory required contribution.....	\$ 37,587	\$ 71,552	\$ 21,143	\$ 51,652
Contribution in relation to statutory required contribution.....	(37,587)	(71,552)	(21,143)	(51,652)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	16.49%	34.85%	23.58%	N/A
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 11,285	\$ (15,986)	\$ 3,472	\$ 22,480
June 30, 2025.....	(20,132)	(23,759)	988	2,821
June 30, 2026.....	(14,790)	(17,760)	2,089	8,137
June 30, 2027.....	47,087	13,823	15,917	(3,362)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 23,450	\$ (43,682)	\$ 22,466	\$ 30,076
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 245,196	\$ 932,999	\$ 197,321	\$ 817,780
Current discount rate (7.15%).....	\$ 198,080	\$ 753,718	\$ 159,405	\$ 660,639
1% increase (8.15%).....	\$ 158,412	\$ 602,778	\$ 127,482	\$ 528,339
Covered Payroll.....	\$ 227,993	\$ 205,342	\$ 89,653	\$ -
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, 2022

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 285,368	\$ 310,034	\$ 504,387	\$ 212,725
Ending net pension liability/(asset).....	\$ 456,630	\$ 558,390	\$ 577,242	\$ 248,169
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 3,355	\$ 4,103	\$ 4,242	\$ 1,824
Net difference between projected and actual investment earnings on pension plan investments.....	36,711	44,893	46,408	19,952
Changes of assumptions.....	7,884	9,642	9,967	4,285
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	79,432	115,404	34,151	10,814
Total Deferred Outflows of Resources.....	\$ 127,382	\$ 174,042	\$ 94,768	\$ 36,875
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 116,846	\$ 69,057	\$ 47,588	\$ 14,941
Pension Expense				
Proportionate share of plan pension expense.....	\$ 47,525	\$ 58,116	\$ 60,077	\$ 25,827
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(20,724)	14,846	(5,005)	5,442
Total Employer Pension Expense.....	\$ 26,801	\$ 72,962	\$ 55,072	\$ 31,269
Contributions				
Statutory required contribution.....	\$ 57,003	\$ 38,322	\$ 50,360	\$ 25,571
Contribution in relation to statutory required contribution.....	(57,003)	(38,322)	(50,360)	(25,571)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	20.64%	16.05%	26.75%	24.73%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ (12,091)	\$ 20,122	\$ 8,279	\$ 10,627
June 30, 2025.....	(11,711)	11,235	10,197	736
June 30, 2026.....	(6,596)	21,146	13,395	2,285
June 30, 2027.....	40,934	52,482	15,309	8,286
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 10,536	\$ 104,985	\$ 47,180	\$ 21,934
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 565,245	\$ 691,210	\$ 714,546	\$ 307,199
Current discount rate (7.15%).....	\$ 456,630	\$ 558,390	\$ 577,242	\$ 248,169
1% increase (8.15%).....	\$ 365,185	\$ 446,566	\$ 461,643	\$ 198,471
Covered Payroll.....	\$ 276,231	\$ 238,722	\$ 188,264	\$ 103,391
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, 2022

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ 370,151	\$ 26,035	\$ (39,887)
Ending net pension liability/(asset).....	\$ -	\$ 597,899	\$ 65,307	\$ 76,911
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 4,393	\$ 480	\$ 565
Net difference between projected and actual investment earnings on pension plan investments.....	-	48,069	5,250	6,183
Changes of assumptions.....	-	10,324	1,128	1,328
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,412	85,428	48,320	86,684
Total Deferred Outflows of Resources.....	\$ 3,412	\$ 148,214	\$ 55,178	\$ 94,760
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ -	\$ 16,813	\$ 98,346	\$ 40,870
Pension Expense				
Proportionate share of plan pension expense.....	\$ -	\$ 62,227	\$ 6,797	\$ 8,006
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,832	22,395	(11,778)	8,723
Total Employer Pension Expense.....	\$ 4,832	\$ 84,622	\$ (4,981)	\$ 16,729
Contributions				
Statutory required contribution.....	\$ -	\$ 46,380	\$ 23,748	\$ 2,960
Contribution in relation to statutory required contribution.....	-	(46,380)	(23,748)	(2,960)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	N/A	19.09%	37.90%	1.48%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2024.....	\$ 2,839	\$ 25,412	\$ (12,373)	\$ 7,894
June 30, 2025.....	573	24,187	(21,185)	8,502
June 30, 2026.....	-	33,069	(21,886)	12,274
June 30, 2027.....	-	48,733	12,276	25,220
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 3,412	\$ 131,401	\$ (43,168)	\$ 53,890
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ -	\$ 740,117	\$ 80,841	\$ 95,205
Current discount rate (7.15%).....	\$ -	\$ 597,899	\$ 65,307	\$ 76,911
1% increase (8.15%).....	\$ -	\$ 478,163	\$ 52,229	\$ 61,509
Covered Payroll.....	\$ -	\$ 242,904	\$ 62,658	\$ 199,771
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2022

	Ayer-Shirley Regional School District	Northern Middlesex Regional Emergency Communications Center	Totals
Net Pension Liability			
Beginning net pension liability/(asset).....	\$ 2,097,697	\$ 328,026	\$ 1,340,727,512
Ending net pension liability/(asset).....	\$ 4,746,593	\$ 582,488	\$ 1,697,060,700
Deferred Outflows of Resources			
Differences between expected and actual experience.....	\$ 34,877	\$ 4,280	\$ 12,469,834
Net difference between projected and actual investment earnings on pension plan investments.....	381,610	46,830	136,437,755
Changes of assumptions.....	81,958	10,058	29,302,605
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,564,488	287,619	64,007,005
Total Deferred Outflows of Resources.....	\$ 2,062,933	\$ 348,787	\$ 242,217,199
Deferred Inflows of Resources			
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,081,219	\$ 5,226	\$ 64,007,005
Pension Expense			
Proportionate share of plan pension expense.....	\$ 494,013	\$ 60,622	\$ 177,084,875
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	70,975	86,980	-
Total Employer Pension Expense.....	\$ 564,988	\$ 147,602	\$ 177,084,875
Contributions			
Statutory required contribution.....	\$ 545,398	\$ -	\$ 153,677,331
Contribution in relation to statutory required contribution.....	(545,398)	-	(156,335,119)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (2,657,788)
Contributions as a percentage of covered payroll.....	12.90%	N/A	28.88%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense			
June 30, 2024.....	\$ 46,738	\$ 96,998	\$ 29,182,639
June 30, 2025.....	127,668	96,674	28,236,293
June 30, 2026.....	197,086	104,167	42,456,355
June 30, 2027.....	610,222	45,722	78,334,907
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 981,714	\$ 343,561	\$ 178,210,194
Discount Rate Sensitivity			
1% decrease (6.15%).....	\$ 5,875,630	\$ 721,040	\$ 2,100,727,873
Current discount rate (7.15%).....	\$ 4,746,593	\$ 582,488	\$ 1,697,060,700
1% increase (8.15%).....	\$ 3,796,037	\$ 465,839	\$ 1,357,206,313
Covered Payroll.....	\$ 4,228,745	\$ 948,422	\$ 541,233,353
See notes to schedule of employer allocations and schedule of pension amounts by employer.			(concluded)

NOTE A – 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 MCRS has elected to use an actuarial based allocation methodology. Accordingly, each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the MCRS'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 on 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 Middlesex Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2018, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the MCRS'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 MCRS have been identified and their total pension liability has been actuarially determined. For transparency purposes, the MCRS 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.

NOTE B – 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.

The following assumption changes were reflected in the January 1, 2022 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.30% to 7.15%.
- The mortality projection scale was updated from MP-2017 to MP-2021.

Changes in Plan Provisions

- None.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2021

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2021

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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

Opinion

We have audited the accompanying financial statements of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2021, and the related notes to the financial statements, which collectively comprise the MCRS's financial statements as listed in the table of contents.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the MCRS as of December 31, 2021, and the changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

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. Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Financial Statements section of our report. We are required to be independent of the MCRS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management's 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, and for 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.

In preparing the financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the MCRS's ability to continue as a going concern for twelve months beyond the financial statement date, including any currently known information that may raise substantial doubt shortly thereafter.

Auditor's Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a

guarantee that an audit conducted in accordance with generally accepted auditing standards will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the financial statements.

In performing an audit in accordance with generally accepted auditing standards, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, and design and perform auditing procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements.
- Obtain an understanding of internal control relevant to the audit 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 MCRS's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the financial statements.
- Conclude whether, in our judgement, there are conditions or events, considered in the aggregate, that raise substantial doubt about the MCRS's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that 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 is the responsibility of management and, 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 23, 2022, on our consideration of the MCRS'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 solely 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 effectiveness of MCRS's 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 MCRS's internal control over financial reporting and compliance.

Restriction on Use

This report is intended solely for the information and use of MCRS, 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.

A handwritten signature in black ink, appearing to read "Powers & Sullivan LLC". The signature is written in a cursive, flowing style.

August 23, 2022

Management's Discussion and Analysis

As management of the Middlesex County Retirement System (MCRS), we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2021. The MCRS 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 MCRS's assets exceeded its liabilities at the close of the most recent year by \$2.1 billion (net position).
- The MCRS's net position increased by \$353.6 million for the year ended December 31, 2021.
- Total investment income was \$349.7 million; investment expenses were \$9.4 million; and net investment income was \$340.2 million.
- Total contributions were \$214.5 million, primarily consisting of \$147.8 million from employers, \$51.7 million from members, \$8.4 million in transfers from other systems and \$6.5 million in other contributions.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$197.7 million.
- Depreciation, administrative and building expenses were \$3.4 million.
- The total pension liability was \$3.5 billion as of December 31, 2021, while the net pension liability was \$1.3 billion.
- The Plan fiduciary net position as a percentage of the total pension liability was 61.14%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the MCRS's 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 fiduciary 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 MCRS'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 MCRS's financial position. The MCRS's assets exceeded liabilities by \$2.1 billion at the close of 2021.

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 MCRS's net position included investments of \$2.08 billion, cash of \$18.5 million and current accounts receivable of \$4.9 million. The system also had capital assets, net of accumulated depreciation, of \$4.1 million at year-end primarily consisting of land, an office building, and building improvements.

In 2021, the MCRS's contributions were \$214.5 million while deductions were \$201.1 million which resulted in a current surplus of \$13.4 million. In 2020, the MCRS's contributions were \$196.5 million while deductions were \$191.3 million which resulted in a prior year surplus of \$5.2 million. Therefore, for these two years the MCRS 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 \$340.2 million in 2021, and \$185.4 million in 2020. The annual money weighted rate of return was 19.86% and 12.26% in 2021, and 2020, respectively. The MCRS's investment policy is designed to achieve a long-term rate of return of 7.15% and fluctuation in annual investment returns is expected.

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

	2021	2020
Assets:		
Cash.....	\$ 18,455,232	\$ 41,101,439
Investments.....	2,082,386,263	1,706,314,629
Receivables.....	4,949,242	4,435,670
Capital assets, net of accumulated depreciation....	4,108,907	4,429,195
Total assets.....	2,109,899,644	1,756,280,933
Liabilities:		
Accounts payable.....	102,089	115,997
Other liabilities.....	26,556	26,606
Total liabilities.....	128,645	142,603
Net Position Restricted for Pensions.....	\$ 2,109,770,999	\$ 1,756,138,330

	2021	2020
Additions:		
Contributions:		
Member contributions.....	\$ 51,747,946	\$ 50,973,950
Employer contributions.....	147,955,483	138,327,737
Other contributions.....	14,791,325	7,185,413
Total contributions.....	214,494,754	196,487,100
Net investment income:		
Total investment income.....	349,671,539	192,871,896
Less, investment expenses.....	(9,428,015)	(7,442,169)
Net investment income.....	340,243,524	185,429,727
Total additions.....	554,738,278	381,916,827
Deductions:		
Administration.....	2,878,819	2,781,367
Retirement benefits, refunds and transfers.....	197,701,698	187,995,148
Building operations and maintenance.....	204,804	208,858
Depreciation.....	320,288	321,386
Total deductions.....	201,105,609	191,306,759
Net increase (decrease) in fiduciary net position....	353,632,669	190,610,068
Fiduciary net position at beginning of year.....	1,756,138,330	1,565,528,262
Fiduciary net position at end of year.....	\$ 2,109,770,999	\$ 1,756,138,330

Requests for Information

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

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2021

Assets	
Cash and cash equivalents.....	\$ 18,455,232
Investments:	
Investments in Pension Reserve Investment Trust...	2,077,485,448
Pooled alternative investments.....	4,863,412
Pooled real estate funds.....	<u>37,403</u>
Total investments.....	<u>2,082,386,263</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	4,294,279
Member contributions.....	9,017
Employer pension appropriation.....	42,295
Member make-up payments and redeposits.....	217,870
Transfers from other systems.....	345,041
Other accounts receivable.....	<u>40,740</u>
Total Receivables.....	<u>4,949,242</u>
Capital assets, net of accumulated depreciation.....	<u>4,108,907</u>
Total Assets.....	<u>2,109,899,644</u>
Liabilities	
Accounts payable.....	102,089
Other liabilities.....	<u>26,556</u>
Total Liabilities.....	<u>128,645</u>
Net Position Restricted for Pensions.....	\$ <u>2,109,770,999</u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2021

Additions:	
Contributions:	
Employer pension appropriation.....	\$ 147,849,683
Member contributions.....	51,747,946
Transfers from other systems.....	8,391,579
3(8)(c) contributions from other systems.....	4,620,024
Workers' compensation settlements.....	105,800
Retirement benefits - state COLA reimbursements.....	556,170
Members' makeup payments and redeposits.....	1,000,847
Interest not refunded.....	<u>222,705</u>
 Total contributions.....	 <u>214,494,754</u>
Net investment income:	
Investment income.....	349,671,539
Less: investment expense.....	<u>(9,428,015)</u>
 Net investment income.....	 <u>340,243,524</u>
 Total additions.....	 <u>554,738,278</u>
Deductions:	
Administration.....	2,878,819
Building operations and maintenance.....	204,804
Retirement benefits and refunds.....	182,979,923
Transfers to other systems.....	6,860,647
3(8)(c) transfer to other systems.....	7,861,128
Depreciation.....	<u>320,288</u>
 Total deductions.....	 <u>201,105,609</u>
 Net increase (decrease) in fiduciary net position.....	 353,632,669
 Fiduciary net position at beginning of year.....	 <u>1,756,138,330</u>
 Fiduciary net position at end of year.....	 <u>\$ 2,109,770,999</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System (MCRS) is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week and who are paid annual compensation of no less than \$5,000. As of January 1, 2022, the MCRS had 71 participating employers.

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

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

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

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

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

Administrative expenses are paid from investment income.

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

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

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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

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

Cash and Investments

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

Fair Value Measurements

The MCRS 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 MCRS'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 MCRS 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:	12/31/2026
Advisory Council Member.....	Brian P. Curtin	Term Expires:	12/31/2024
Elected Member.....	John Brown	Term Expires:	12/31/2023
Elected Member.....	Joseph W. Kearns	Term Expires:	12/31/2022
Appointed Member.....	Robert W. Healy, Jr.	Term Expires:	12/16/2025

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 MCRS. The Board must annually file a financial statement of condition

for the MCRS with the Executive Director of PERAC.

The investment of the MCRS'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 MCRS has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the MCRS 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, 2021, the carrying amount of the MCRS's deposits totaled \$10,778,530, and the bank balance totaled \$13,352,131, all of which was covered by Federal Depository Insurance.

Investments

The MCRS's investments were as follows:

<u>Investment Type</u>	<u>December 31, 2021</u>
PRIT Pooled Funds.....	\$ 2,077,485,448
Money Market Mutual Funds.....	7,676,702
Pooled Alternative Investments...	4,863,412
Pooled Real Estate Funds.....	37,403
Total Investments.....	<u>\$ 2,090,062,965</u>

Approximately 99.4% of the Retirement MCRS'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. The effective weighted duration rate for PRIT investments ranged from 1.33 to 15.12 years.

Approximately 0.2% of the MCRS's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 0.4% of the MCRS'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 19.86%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Value of Investments

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

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

The MCRS had the following recurring fair value measurements as of December 31, 2021:

Investment Type	12/31/2021	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:				
Money Market Mutual Funds.....	\$ 7,676,702	\$ 7,676,702	\$ -	\$ -
Pooled Alternative Investments.....	4,863,412	-	-	4,863,412
Pooled Real Estate Funds.....	37,403	-	-	37,403
Total Investments by fair value level.....	12,577,517	\$ 7,676,702	\$ -	\$ 4,900,815
Investments measured at the net asset value (NAV):				
PRIT Investments.....	2,077,485,448			
Total Investments.....	\$ 2,090,062,965			

Money market mutual funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled alternative investments and pooled real estate funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method.

NOTE 6 – CAPITAL ASSETS

All purchases and building costs in excess of \$25,000 are capitalized at the date of acquisition. Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements.....	40
Vehicles.....	5
Software and equipment.....	5

Capital asset activity for the year ended December 31, 2021, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,099,492	-	-	1,099,492
Vehicles.....	30,913	-	-	30,913
Software and equipment.....	757,189	-	-	757,189
Total capital assets being depreciated.....	7,304,730	-	-	7,304,730
<u>Less accumulated depreciation for:</u>				
Buildings.....	(2,442,066)	(135,428)	-	(2,577,494)
Building improvements.....	(491,557)	(29,740)	-	(521,297)
Vehicles.....	(30,912)	-	-	(30,912)
Software and equipment.....	(583,657)	(155,120)	-	(738,777)
Total accumulated depreciation.....	(3,548,192)	(320,288)	-	(3,868,480)
Total capital assets being depreciated, net.....	3,756,538	(320,288)	-	3,436,250
Total capital assets, net.....	\$ 4,429,195	\$ (320,288)	\$ -	\$ 4,108,907

NOTE 7 – MEMBERSHIP

The following table represents the MCRS's membership at December 31, 2021:

Active members.....	9,432
Inactive members entitled to a return of their employee contributions.....	3,581
Inactive members with a vested right to a deferred or immediate benefit.....	403
Retirees and beneficiaries currently receiving benefits.....	<u>6,284</u>
Total.....	<u>19,700</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2021, were as follows:

Total pension liability.....	\$ 3,450,498,511
The MCRS's fiduciary net position.....	<u>2,109,770,999</u>
The net pension liability.....	\$ <u>1,340,727,512</u>
The MCRS's fiduciary net position as a percentage of the total pension liability.....	61.14%

The total pension liability was determined by an actuarial valuation as of January 1, 2022, using the following actuarial assumptions, applied to all periods included in the measurement that was rolled back to December 31, 2021:

Valuation date.....	January 1, 2022.
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.50% for fiscal 2022 through fiscal 2028, and thereafter the remaining unfunded liability will be amortized on a 4.00% annual increasing basis; ERI liability amortized in level payments.
Remaining amortization period.....	17 years from July 1, 2020, for non-ERI liability, and 2 years from July 1, 2020 for 2010 ERI.
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.
Investment rate of return/Discount rate..	7.15%, previously 7.30%.
Inflation rate.....	3.25%

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.....	3.00% of the first \$16,000 of retirement income.
Mortality Rates:	
Pre-Retirement.....	The RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2021.
Healthy Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2021.
Disabled Retiree.....	The RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year and projected generationally with Scale MP-2021.

Investment policy: The MCRS'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 MCRS's target asset allocation as of December 31, 2021, are summarized in the following table:

Asset Class	Long-Term Expected Asset Allocation	Long-Term Expected Real Rate of Return
Domestic equity.....	22.00%	6.11%
International developed markets equity.....	11.50%	6.49%
International emerging markets equity.....	4.50%	8.12%
Core fixed income.....	15.00%	0.38%
High-yield fixed income.....	8.00%	2.48%
Real estate.....	10.00%	3.72%
Timber.....	4.00%	3.44%
Hedge funds, GTAA, risk parity.....	10.00%	2.63%
Private equity.....	15.00%	9.93%
	<u>100.00%</u>	

Discount rate: The discount rate used to measure the total pension liability was 7.15% at December 31, 2021, and 7.30% at December 31, 2020. 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 MCRS's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the discount rate: The following presents the net pension liability, calculated using the discount rate of 7.15%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.15%) or 1-percentage-point higher (8.15%) than the current rate:

	1% Decrease (6.15%)	Current Discount (7.15%)	1% Increase (8.15%)
Middlesex County Retirement System's net pension liability as of December 31, 2021.....	\$ 1,734,275,212	\$ 1,340,727,512	\$ 1,009,270,759

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 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

There were no GASB pronouncements required to be implemented in 2021 that impacted the MCRS's financial statements.

None of the issued GASB statements that are required to be implemented in future years are anticipated to impact the MCRS's financial statements.

NOTE 10 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through August 23, 2022, which is the date the financial statements were available to be issued.

The Retirement System carries its investments at fair (market) value in accordance with Generally Accepted Accounting Principles (GAAP). Market value adjustments are recorded monthly. Subsequent to year end, the System's investments had declined in value by approximately 7.0%. The market value decline is consistent with recent trends in the overall financial securities market.

In accordance with GAAP, the System has not recorded the losses in its financial statements as the impairments were not known as of December 31, 2021. The System has recorded the losses associated with the investment during the year 2022.

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Required Supplementary Information

Middlesex County Retirement System

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Required Supplementary Information

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

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

	December 31, 2018	December 31, 2019	December 31, 2020	December 31, 2021
\$	64,615,910	\$ 66,816,001	\$ 73,591,385	\$ 76,097,081
	208,614,148	216,905,943	229,825,239	238,805,957
	-	29,156,339	-	-
	-	46,671,873	-	5,225,766
	-	65,013,900	-	27,166,375
	<u>(161,259,804)</u>	<u>(168,486,003)</u>	<u>(181,769,445)</u>	<u>(184,028,124)</u>
	111,970,254	256,078,053	121,647,179	163,267,055
	<u>2,797,535,970</u>	<u>2,909,506,224</u>	<u>3,165,584,277</u>	<u>3,287,231,456</u>
\$	<u>2,909,506,224</u>	<u>3,165,584,277</u>	<u>3,287,231,456</u>	<u>3,450,498,511</u>
\$	120,614,676	\$ 129,685,755	\$ 138,290,237	\$ 147,849,683
	45,984,957	48,445,698	50,973,950	51,747,946
	9,581,643	10,842,796	7,222,913	14,897,125
	(31,074,711)	208,322,511	185,429,727	340,243,524
	(2,645,568)	(2,754,384)	(2,781,367)	(2,878,819)
	(309,357)	(279,208)	(208,858)	(204,804)
	<u>(161,259,804)</u>	<u>(168,486,003)</u>	<u>(181,769,445)</u>	<u>(184,028,124)</u>
	(8,884,478)	(9,969,856)	(6,225,703)	(13,673,574)
	<u>(318,812)</u>	<u>(318,812)</u>	<u>(321,386)</u>	<u>(320,288)</u>
	(28,311,454)	215,488,497	190,610,068	353,632,669
	<u>1,378,351,219</u>	<u>1,350,039,765</u>	<u>1,565,528,262</u>	<u>1,756,138,330</u>
\$	<u>1,350,039,765</u>	<u>1,565,528,262</u>	<u>1,756,138,330</u>	<u>2,109,770,999</u>
\$	<u>1,559,466,459</u>	<u>1,600,056,015</u>	<u>1,531,093,126</u>	<u>1,340,727,512</u>
	46.40%	49.45%	53.42%	61.14%
\$	471,115,185	\$ 492,109,775	\$ 513,201,283	\$ 519,239,589
	331.02%	325.14%	298.34%	258.21%

SCHEDULE OF CONTRIBUTIONS

Year	Actuarially determined contribution	Contributions in relation to the actuarially determined contribution	Contribution deficiency (excess)	Covered payroll	Contributions as a percentage of covered payroll
December 31, 2021.....	\$ 144,255,207	\$ (147,852,245)	\$ (3,597,038)	\$ 519,239,589	28.47%
December 31, 2020.....	135,472,822	(138,290,237)	(2,817,415)	513,201,283	26.95%
December 31, 2019.....	127,151,838	(129,685,754)	(2,533,916)	492,109,775	26.35%
December 31, 2018.....	119,298,291	(120,614,676)	(1,316,385)	471,115,185	25.60%
December 31, 2017.....	112,017,087	(115,426,815)	(3,409,728)	451,777,105	25.55%
December 31, 2016.....	105,246,797	(107,067,707)	(1,820,910)	439,644,322	24.35%
December 31, 2015.....	98,792,642	(99,820,481)	(1,027,839)	432,382,921	23.09%
December 31, 2014.....	92,826,743	(93,400,946)	(574,203)	415,752,810	22.47%

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

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, 2021.....	19.86%
December 31, 2020.....	12.26%
December 31, 2019.....	16.21%
December 31, 2018.....	-2.52%
December 31, 2017.....	17.25%
December 31, 2016.....	7.35%
December 31, 2015.....	0.61%
December 31, 2014.....	7.54%

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

See notes to required supplementary information.

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

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

NOTE B – CONTRIBUTIONS

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

NOTE C – MONEY WEIGHTED RATE OF RETURN

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

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONS

The following changes were reflected in the January 1, 2022 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.30% to 7.15%.
- The mortality projection scale was updated from MP-2017 to MP-2021.

Changes in Plan Provisions

- None.

Audit of Specific Elements, Accounts and Items of Financial Statements

Middlesex County Retirement System

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*Audit of Specific Elements Accounts and
Items of Financial Statements*

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Independent Auditor's Report

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

Report on the Audit of the Schedule of Employer Allocations and Schedule of Pension Amounts by Employer

Opinion

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, 2021, 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 contributions and total pension expense included in the accompanying schedule pension amounts by employer of the MCRS Pension Plan as of and for the year ended December 31, 2021, and the related notes.

In our opinion, the accompanying schedule of employer allocations and schedule of pension amounts by employer present fairly, in all material respects, the employer allocations and net pension liability, total deferred outflows of resources, total deferred inflows of resources, total contributions and total pension expense for the total of all participating entities for the MCRS as of and for the year ended December 31, 2021, in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (GAAS). Our responsibilities under those standards are further described in the Auditor's Responsibilities for the Audit of the Schedules section of our report. We are required to be independent of the MCRS and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinions.

Responsibilities of Management for the Schedules

Management is responsible for the preparation and fair presentation of the schedules in accordance with accounting principles generally accepted in the United States of America and for 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 Responsibilities for the Audit of the Schedules

Our objectives are to obtain reasonable assurance about whether the schedule of employer allocations and the specified row totals included in the schedule of pension amounts by employer as a whole are free from material

misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgement made by a reasonable user based on the schedules.

In performing an audit in accordance with GAAS, we:

- Exercise professional judgement and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the schedules, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the schedules.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purposes of expressing an opinion on the effectiveness of the MCRS's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the schedules.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

Other Matter

We have audited, in accordance with GAAS, the financial statements of the MCRS as of and for the year ended December 31, 2021, and our report thereon, dated August 23, 2022, expressed an unmodified opinion on those financial statements.

Restriction on Use

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



August 23, 2022

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2021

Employer	Share of Net Pension Liability/(Asset)	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.000000%
Middlesex County.....	-	0.000000%
Middlesex Hospital.....	-	0.000000%
Town of Acton.....	44,317,853	3.305508%
Town of Ashby.....	1,370,949	0.102254%
Town of Ashland.....	29,025,102	2.164877%
Town of Ayer.....	16,034,552	1.195959%
Town of Bedford.....	44,033,584	3.284305%
Town of Billerica.....	136,488,741	10.180200%
Town of Boxborough.....	10,220,882	0.762338%
Town of Burlington.....	118,806,981	8.861382%
Town of Carlisle.....	8,806,565	0.656850%
Town of Chelmsford.....	100,318,386	7.482384%
Town of Dracut.....	62,185,294	4.638175%
Town of Dunstable.....	2,299,674	0.171524%
Town of Groton.....	19,238,916	1.434961%
Town of Holliston.....	18,170,200	1.355249%
Town of Hopkinton.....	16,725,088	1.247464%
Town of Hudson.....	59,893,267	4.467221%
Town of Lincoln.....	24,515,962	1.828557%
Town of Littleton.....	19,636,977	1.464651%
Town of North Reading.....	44,566,036	3.324019%
Town of Pepperell.....	15,377,884	1.146981%
Town of Sherborn.....	8,564,819	0.638819%
Town of Shirley.....	8,630,720	0.643734%
Town of Stow.....	11,352,166	0.846717%
Town of Sudbury.....	54,643,133	4.075633%
Town of Tewksbury.....	99,361,547	7.411017%
Town of Townsend.....	4,774,763	0.356132%
Town of Tyngsborough.....	21,175,029	1.579369%
Town of Wayland.....	46,247,117	3.449405%
Town of Westford.....	44,844,218	3.344767%
Town of Weston.....	59,360,735	4.427502%
Town of Wilmington.....	76,302,617	5.691135%
Acton-Boxborough Regional School District.....	24,866,009	1.854665%
Acton Water Supply.....	3,246,366	0.242135%
Bedford Housing Authority.....	255,587	0.019063%
Billerica Housing Authority.....	1,042,229	0.077736%
Chelmsford Housing Authority.....	1,656,493	0.123552%
Chelmsford Water District.....	(1,005,744)	-0.075015%
Dracut Housing Authority.....	1,703,681	0.127071%
Dracut Water Supply.....	3,204,541	0.239015%

(Continued)

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2021

Employer	Share of Net Pension Liability/(Asset)	Percent of Total Net Pension Liability
East Chelmsford Water District.....	183,163	0.013661%
East Middlesex Mosquito Control.....	465,506	0.034720%
Greater Lowell Regional Vocational Technical School District.....	17,260,795	1.287420%
Groton-Dunstable Regional School District.....	11,406,839	0.850795%
Hudson Housing Authority.....	568,228	0.042382%
Lincoln-Sudbury Regional School District.....	8,307,816	0.619650%
Nashoba Valley Technical High School District.....	3,439,271	0.256523%
North Chelmsford Water District.....	628,790	0.046899%
North Middlesex Regional School District.....	11,254,512	0.839433%
Shawsheen Valley Regional Vocational School.....	8,099,773	0.604133%
South Middlesex Regional Vocational Technical School.....	6,194,749	0.462044%
Sudbury Water District.....	1,399,802	0.104406%
Tewksbury Housing Authority.....	1,475,444	0.110048%
Wayland Housing Authority.....	371,407	0.027702%
Hopkinton Housing Authority.....	498,319	0.037168%
Sudbury Housing Authority.....	458,401	0.034190%
Wilmington Housing Authority.....	185,577	0.013842%
Acton Housing Authority.....	721,454	0.053811%
Burlington Housing Authority.....	4,057	0.000303%
Ayer Housing Authority.....	691,363	0.051566%
Holliston Housing Authority.....	93,451	0.006970%
Littleton Housing Authority.....	665,340	0.049625%
Westford Housing Authority.....	285,368	0.021285%
Shirley Water District.....	310,034	0.023124%
Tyngsborough Housing Authority.....	504,387	0.037620%
Pepperell Housing Authority.....	212,725	0.015866%
Groton Housing Authority.....	-	0.000000%
Tyngsborough Water District.....	370,151	0.027608%
North Reading Housing Authority.....	26,035	0.001942%
West Groton Water.....	(39,887)	-0.002975%
Ayer-Shirley Regional School District.....	2,097,697	0.156460%
Northern Middlesex Regional Emergency Communications Center.....	328,026	0.024466%
Total.....	\$ 1,340,727,512	100.000%

(Concluded)

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

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2021

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 52,615,628
Ending net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 44,317,853
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 755,287
Changes of assumptions.....	-	-	-	1,578,005
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	14,416
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 2,347,708
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ -	\$ -	\$ -	\$ 7,535,277
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	1,784,770
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 9,320,047
Pension Expense				
Proportionate share of plan pension expense.....	\$ 428,815	\$ -	\$ -	\$ 3,711,239
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(110,017)
Total Employer Pension Expense.....	\$ 428,815	\$ -	\$ -	\$ 3,601,222
Contributions				
Statutory required contribution.....	\$ 428,815	\$ -	\$ -	\$ 4,814,701
Contribution in relation to statutory required contribution.....	(428,815)	-	-	(4,821,666)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (6,965)
Contributions as a percentage of covered payroll.....	32.02%	0.00%	0.00%	32.31%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ -	\$ -	\$ -	\$ (1,190,679)
June 30, 2024.....	-	-	-	(2,094,556)
June 30, 2025.....	-	-	-	(2,089,241)
June 30, 2026.....	-	-	-	(1,597,863)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ (6,972,339)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ -	\$ -	\$ -	\$ 57,326,603
Current discount rate (7.15%).....	\$ -	\$ -	\$ -	\$ 44,317,853
1% increase (8.15%).....	\$ -	\$ -	\$ -	\$ 33,361,524
Covered Payroll.....	\$ 1,339,300	\$ -	\$ -	\$ 14,922,594
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, 2021

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 1,775,392	\$ 35,887,576	\$ 19,150,544	\$ 51,394,381
Ending net pension liability/(asset).....	\$ 1,370,949	\$ 29,025,102	\$ 16,034,552	\$ 44,033,584
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 23,364	\$ 494,661	\$ 273,269	\$ 750,443
Changes of assumptions.....	48,815	1,033,483	570,935	1,567,883
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	41,871	356,649	71,405	94,043
Total Deferred Outflows of Resources.....	\$ 114,050	\$ 1,884,793	\$ 915,609	\$ 2,412,369
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 233,100	\$ 4,935,081	\$ 2,726,323	\$ 7,486,944
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	165,720	1,976,868	436,870	1,808,571
Total Deferred Inflows of Resources.....	\$ 398,820	\$ 6,911,949	\$ 3,163,193	\$ 9,295,515
Pension Expense				
Proportionate share of plan pension expense.....	\$ 114,805	\$ 2,430,602	\$ 1,342,754	\$ 3,687,434
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	49,164	(136,315)	74,178	(721,874)
Total Employer Pension Expense.....	\$ 163,969	\$ 2,294,287	\$ 1,416,932	\$ 2,965,560
Contributions				
Statutory required contribution.....	\$ 240,126	\$ 3,563,976	\$ 1,934,480	\$ 4,965,363
Contribution in relation to statutory required contribution.....	(240,126)	(3,598,325)	(2,234,480)	(4,966,807)
Contribution deficiency/(excess).....	\$ -	\$ (34,349)	\$ (300,000)	\$ (1,444)
Contributions as a percentage of covered payroll.....	24.19%	23.28%	30.58%	25.36%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (44,300)	\$ (733,783)	\$ (341,208)	\$ (1,305,064)
June 30, 2024.....	(106,627)	(1,461,335)	(731,463)	(2,282,864)
June 30, 2025.....	(73,015)	(1,587,638)	(671,996)	(1,919,816)
June 30, 2026.....	(60,828)	(1,244,400)	(602,917)	(1,375,402)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (284,770)	\$ (5,027,156)	\$ (2,247,584)	\$ (6,883,146)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 1,773,368	\$ 37,544,926	\$ 20,741,221	\$ 56,958,892
Current discount rate (7.15%).....	\$ 1,370,949	\$ 29,025,102	\$ 16,034,552	\$ 44,033,584
1% increase (8.15%).....	\$ 1,032,021	\$ 21,849,471	\$ 12,070,465	\$ 33,147,532
Covered Payroll.....	\$ 992,577	\$ 15,457,970	\$ 7,307,387	\$ 19,572,584
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, 2021

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlsle
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 152,215,238	\$ 12,166,423	\$ 133,422,263	\$ 10,349,764
Ending net pension liability/(asset).....	\$ 136,488,741	\$ 10,220,882	\$ 118,806,981	\$ 8,806,565
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,326,115	\$ 174,189	\$ 2,024,769	\$ 150,086
Changes of assumptions.....	4,859,892	363,930	4,230,305	313,571
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,837,939	357,785	2,927,496	148,410
Total Deferred Outflows of Resources.....	\$ 10,023,946	\$ 895,904	\$ 9,182,570	\$ 612,067
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 23,206,914	\$ 1,737,836	\$ 20,200,517	\$ 1,497,363
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	591,897	379,548	334,022	223,522
Total Deferred Inflows of Resources.....	\$ 23,798,811	\$ 2,117,384	\$ 20,534,539	\$ 1,720,885
Pension Expense				
Proportionate share of plan pension expense.....	\$ 11,429,756	\$ 855,910	\$ 9,949,061	\$ 737,473
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(472,654)	111,338	1,179,597	(15,013)
Total Employer Pension Expense.....	\$ 10,957,102	\$ 967,248	\$ 11,128,658	\$ 722,460
Contributions				
Statutory required contribution.....	\$ 13,584,397	\$ 1,144,434	\$ 11,757,449	\$ 1,192,106
Contribution in relation to statutory required contribution.....	(13,587,241)	(1,144,434)	(11,757,449)	(1,192,106)
Contribution deficiency/(excess).....	\$ (2,844)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	35.49%	32.45%	31.59%	19.37%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (1,965,504)	\$ (92,511)	\$ (1,067,956)	\$ (81,370)
June 30, 2024.....	(4,112,940)	(297,684)	(3,118,396)	(406,529)
June 30, 2025.....	(4,491,409)	(462,882)	(4,176,403)	(371,363)
June 30, 2026.....	(3,205,012)	(368,403)	(2,989,214)	(249,556)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (13,774,865)	\$ (1,221,480)	\$ (11,351,969)	\$ (1,108,818)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 176,552,684	\$ 13,221,048	\$ 153,680,744	\$ 11,391,582
Current discount rate (7.15%).....	\$ 136,488,741	\$ 10,220,882	\$ 118,806,981	\$ 8,806,565
1% increase (8.15%).....	\$ 102,745,781	\$ 7,694,060	\$ 89,435,333	\$ 6,629,392
Covered Payroll.....	\$ 38,284,144	\$ 3,526,748	\$ 37,219,280	\$ 6,153,577
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, 2021

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 110,931,084	\$ 66,580,110	\$ 3,218,104	\$ 24,595,262
Ending net pension liability/(asset).....	\$ 100,318,386	\$ 62,185,294	\$ 2,299,674	\$ 19,238,916
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,709,677	\$ 1,059,793	\$ 39,192	\$ 327,879
Changes of assumptions.....	3,571,990	2,214,203	81,883	685,031
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,002,347	3,692,727	150,370	577,786
Total Deferred Outflows of Resources.....	\$ 8,284,014	\$ 6,966,723	\$ 271,445	\$ 1,590,696
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 17,056,938	\$ 10,573,243	\$ 391,009	\$ 3,271,155
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	552,719	120,361	382,628	1,886,868
Total Deferred Inflows of Resources.....	\$ 17,609,657	\$ 10,693,604	\$ 773,637	\$ 5,158,023
Pension Expense				
Proportionate share of plan pension expense.....	\$ 8,400,801	\$ 5,207,483	\$ 192,579	\$ 1,611,095
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	873,243	1,257,711	50,819	(322,137)
Total Employer Pension Expense.....	\$ 9,274,044	\$ 6,465,194	\$ 243,398	\$ 1,288,958
Contributions				
Statutory required contribution.....	\$ 9,883,109	\$ 6,152,234	\$ 367,320	\$ 2,385,255
Contribution in relation to statutory required contribution.....	(10,283,109)	(6,152,234)	(367,320)	(2,385,255)
Contribution deficiency/(excess).....	\$ (400,000)	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	34.29%	35.54%	25.59%	28.98%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (1,362,912)	\$ (94,404)	\$ (51,974)	\$ (497,951)
June 30, 2024.....	(2,823,588)	(1,222,104)	(120,447)	(902,577)
June 30, 2025.....	(3,032,297)	(1,497,342)	(172,573)	(1,180,239)
June 30, 2026.....	(2,106,846)	(913,031)	(157,198)	(986,560)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (9,325,643)	\$ (3,726,881)	\$ (502,192)	\$ (3,567,327)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 129,765,138	\$ 80,438,727	\$ 2,974,704	\$ 24,886,172
Current discount rate (7.15%).....	\$ 100,318,386	\$ 62,185,294	\$ 2,299,674	\$ 19,238,916
1% increase (8.15%).....	\$ 75,517,518	\$ 46,811,748	\$ 1,731,145	\$ 14,482,641
Covered Payroll.....	\$ 29,987,946	\$ 17,308,432	\$ 1,435,309	\$ 8,229,713
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, 2021

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 25,050,502	\$ 24,085,505	\$ 66,148,477	\$ 26,477,563
Ending net pension liability/(asset).....	\$ 18,170,200	\$ 16,725,088	\$ 59,893,267	\$ 24,515,962
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 309,666	\$ 285,037	\$ 1,020,732	\$ 417,814
Changes of assumptions.....	646,978	595,522	2,132,592	872,928
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	223,070	596,398	1,697,746	1,207,163
Total Deferred Outflows of Resources.....	\$ 1,179,714	\$ 1,476,957	\$ 4,851,070	\$ 2,497,905
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 3,089,443	\$ 2,843,734	\$ 10,183,534	\$ 4,168,401
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,586,151	3,457,221	672,302	249,099
Total Deferred Inflows of Resources.....	\$ 6,675,594	\$ 6,300,955	\$ 10,855,836	\$ 4,417,500
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,521,598	\$ 1,400,584	\$ 5,015,544	\$ 2,053,002
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(833,925)	(416,652)	219,026	100,907
Total Employer Pension Expense.....	\$ 687,673	\$ 983,932	\$ 5,234,570	\$ 2,153,909
Contributions				
Statutory required contribution.....	\$ 2,589,575	\$ 2,910,419	\$ 6,381,731	\$ 2,587,296
Contribution in relation to statutory required contribution.....	(2,589,575)	(2,916,805)	(6,387,468)	(2,589,045)
Contribution deficiency/(excess).....	\$ -	\$ (6,386)	\$ (5,737)	\$ (1,749)
Contributions as a percentage of covered payroll.....	22.16%	15.72%	27.94%	22.71%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (1,094,841)	\$ (627,969)	\$ (868,990)	\$ (168,864)
June 30, 2024.....	(1,682,588)	(1,447,759)	(2,118,814)	(736,219)
June 30, 2025.....	(1,489,246)	(1,515,705)	(1,824,938)	(641,414)
June 30, 2026.....	(1,229,205)	(1,232,565)	(1,192,024)	(373,098)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (5,495,880)	\$ (4,823,998)	\$ (6,004,766)	\$ (1,919,595)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 23,503,752	\$ 21,634,452	\$ 77,473,914	\$ 31,712,205
Current discount rate (7.15%).....	\$ 18,170,200	\$ 16,725,088	\$ 59,893,267	\$ 24,515,962
1% increase (8.15%).....	\$ 13,678,135	\$ 12,590,286	\$ 45,086,360	\$ 18,455,088
Covered Payroll.....	\$ 11,683,621	\$ 18,552,588	\$ 22,864,683	\$ 11,398,289
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, 2021

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 23,466,261	\$ 50,095,267	\$ 17,612,899	\$ 9,801,713
Ending net pension liability/(asset).....	\$ 19,636,977	\$ 44,566,036	\$ 15,377,884	\$ 8,564,819
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 334,663	\$ 759,517	\$ 262,078	\$ 145,966
Changes of assumptions.....	699,205	1,586,842	547,553	304,964
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,451,193	392,765	19,470	120,522
Total Deferred Outflows of Resources.....	\$ 2,485,061	\$ 2,739,124	\$ 829,101	\$ 571,452
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 3,338,837	\$ 7,577,475	\$ 2,614,671	\$ 1,456,259
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	159,606	662,566	111,471	481,950
Total Deferred Inflows of Resources.....	\$ 3,498,443	\$ 8,240,041	\$ 2,726,142	\$ 1,938,209
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,644,428	\$ 3,732,022	\$ 1,287,765	\$ 717,230
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	577,715	(256,301)	(93,579)	(208,249)
Total Employer Pension Expense.....	\$ 2,222,143	\$ 3,475,721	\$ 1,194,186	\$ 508,981
Contributions				
Statutory required contribution.....	\$ 2,730,527	\$ 4,553,483	\$ 1,671,047	\$ 1,047,555
Contribution in relation to statutory required contribution.....	(4,061,166)	(4,553,483)	(1,672,631)	(1,047,555)
Contribution deficiency/(excess).....	\$ (1,330,639)	\$ -	\$ (1,584)	\$ -
Contributions as a percentage of covered payroll.....	27.22%	32.25%	30.54%	22.66%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ 349,254	\$ (1,025,673)	\$ (294,464)	\$ (317,880)
June 30, 2024.....	(393,914)	(1,808,640)	(594,960)	(535,800)
June 30, 2025.....	(615,099)	(1,564,551)	(582,114)	(300,870)
June 30, 2026.....	(353,623)	(1,102,053)	(425,503)	(212,207)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (1,013,382)	\$ (5,500,917)	\$ (1,897,041)	\$ (1,366,757)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 25,401,077	\$ 57,647,636	\$ 19,891,800	\$ 11,078,876
Current discount rate (7.15%).....	\$ 19,636,977	\$ 44,566,036	\$ 15,377,884	\$ 8,564,819
1% increase (8.15%).....	\$ 14,782,293	\$ 33,548,351	\$ 11,576,139	\$ 6,447,411
Covered Payroll.....	\$ 14,917,191	\$ 14,117,838	\$ 5,476,497	\$ 4,623,108
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, 2021

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 8,952,975	\$ 11,389,407	\$ 61,745,935	\$ 104,198,258
Ending net pension liability/(asset).....	\$ 8,630,720	\$ 11,352,166	\$ 54,643,133	\$ 99,361,547
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 147,089	\$ 193,469	\$ 931,256	\$ 1,693,370
Changes of assumptions.....	307,310	404,211	1,945,653	3,537,920
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	643,092	1,147,453	304,228	6,514,025
Total Deferred Outflows of Resources.....	\$ 1,097,491	\$ 1,745,133	\$ 3,181,137	\$ 11,745,315
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 1,467,464	\$ 1,930,186	\$ 9,290,864	\$ 16,894,248
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,403	20,129	759,061	565,487
Total Deferred Inflows of Resources.....	\$ 1,468,867	\$ 1,950,315	\$ 10,049,925	\$ 17,459,735
Pension Expense				
Proportionate share of plan pension expense.....	\$ 722,749	\$ 950,646	\$ 4,575,891	\$ 8,320,672
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	83,762	280,843	(97,985)	1,808,853
Total Employer Pension Expense.....	\$ 806,511	\$ 1,231,489	\$ 4,477,906	\$ 10,129,525
Contributions				
Statutory required contribution.....	\$ 812,736	\$ 1,077,698	\$ 5,622,886	\$ 9,177,392
Contribution in relation to statutory required contribution.....	(812,736)	(1,077,698)	(5,622,886)	(9,177,392)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	41.84%	28.15%	29.89%	37.23%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ 19,201	\$ 106,023	\$ (1,304,168)	\$ (534,543)
June 30, 2024.....	(152,615)	(144,249)	(2,198,073)	(1,963,247)
June 30, 2025.....	(160,637)	(144,421)	(1,958,505)	(2,064,903)
June 30, 2026.....	(77,325)	(22,535)	(1,408,042)	(1,151,727)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (371,376)	\$ (205,182)	\$ (6,868,788)	\$ (5,714,420)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 11,164,121	\$ 14,684,401	\$ 70,682,693	\$ 128,527,435
Current discount rate (7.15%).....	\$ 8,630,720	\$ 11,352,166	\$ 54,643,133	\$ 99,361,547
1% increase (8.15%).....	\$ 6,497,020	\$ 8,545,666	\$ 41,134,172	\$ 74,797,230
Covered Payroll.....	\$ 1,942,258	\$ 3,828,104	\$ 18,814,338	\$ 24,651,278
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, 2021

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 8,103,799	\$ 24,002,922	\$ 56,416,777	\$ 56,098,309
Ending net pension liability/(asset).....	\$ 4,774,763	\$ 21,175,029	\$ 46,247,117	\$ 44,844,218
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 81,374	\$ 360,876	\$ 788,167	\$ 764,258
Changes of assumptions.....	170,013	753,969	1,646,700	1,596,747
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	96,188	759,785	58,540	500,972
Total Deferred Outflows of Resources.....	\$ 347,575	\$ 1,874,630	\$ 2,493,407	\$ 2,861,977
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 811,844	\$ 3,600,349	\$ 7,863,306	\$ 7,624,774
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,033,266	-	3,252,009	3,693,847
Total Deferred Inflows of Resources.....	\$ 2,845,110	\$ 3,600,349	\$ 11,115,315	\$ 11,318,621
Pension Expense				
Proportionate share of plan pension expense.....	\$ 399,844	\$ 1,773,226	\$ 3,872,798	\$ 3,755,317
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(655,438)	44,324	(1,229,247)	(678,704)
Total Employer Pension Expense.....	\$ (255,594)	\$ 1,817,550	\$ 2,643,551	\$ 3,076,613
Contributions				
Statutory required contribution.....	\$ 934,704	\$ 2,462,187	\$ 5,378,336	\$ 5,950,276
Contribution in relation to statutory required contribution.....	(934,704)	(2,462,187)	(5,378,336)	(5,950,276)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.91%	27.23%	25.39%	22.31%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (560,101)	\$ 4,103	\$ (1,659,902)	\$ (1,276,212)
June 30, 2024.....	(737,820)	(506,516)	(2,646,624)	(2,677,209)
June 30, 2025.....	(622,711)	(719,204)	(2,414,757)	(2,528,293)
June 30, 2026.....	(576,803)	(504,102)	(1,900,625)	(1,974,830)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (2,497,535)	\$ (1,725,719)	\$ (6,621,908)	\$ (8,456,644)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 6,176,313	\$ 27,390,598	\$ 59,822,170	\$ 58,007,474
Current discount rate (7.15%).....	\$ 4,774,763	\$ 21,175,029	\$ 46,247,117	\$ 44,844,218
1% increase (8.15%).....	\$ 3,594,339	\$ 15,940,105	\$ 34,813,832	\$ 33,757,760
Covered Payroll.....	\$ 3,607,178	\$ 9,042,420	\$ 21,184,193	\$ 26,671,296
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, 2021

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 64,849,395	\$ 86,423,315	\$ 30,083,545	\$ 3,548,184
Ending net pension liability/(asset).....	\$ 59,360,735	\$ 76,302,617	\$ 24,866,009	\$ 3,246,366
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,011,656	\$ 1,300,388	\$ 423,779	\$ 55,326
Changes of assumptions.....	2,113,630	2,716,872	885,392	115,592
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,851,892	1,345,055	408,886	56,708
Total Deferred Outflows of Resources.....	\$ 4,977,178	\$ 5,362,315	\$ 1,718,057	\$ 227,626
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 10,092,989	\$ 12,973,584	\$ 4,227,919	\$ 551,973
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	544,687	261,431	1,039,352	119,417
Total Deferred Inflows of Resources.....	\$ 10,637,676	\$ 13,235,015	\$ 5,267,271	\$ 671,390
Pension Expense				
Proportionate share of plan pension expense.....	\$ 4,970,950	\$ 6,389,687	\$ 2,082,316	\$ 271,855
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(280,114)	372,046	(85,208)	(46,644)
Total Employer Pension Expense.....	\$ 4,690,836	\$ 6,761,733	\$ 1,997,108	\$ 225,211
Contributions				
Statutory required contribution.....	\$ 5,898,122	\$ 7,801,298	\$ 3,124,290	\$ 268,502
Contribution in relation to statutory required contribution.....	(5,898,122)	(9,306,639)	(3,124,290)	(268,502)
Contribution deficiency/(excess).....	\$ -	\$ (1,505,341)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	27.13%	36.92%	21.25%	21.54%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (842,684)	\$ (1,177,785)	\$ (451,305)	\$ (94,722)
June 30, 2024.....	(1,928,421)	(2,467,635)	(1,015,154)	(152,066)
June 30, 2025.....	(1,763,843)	(2,511,551)	(1,157,489)	(124,279)
June 30, 2026.....	(1,125,550)	(1,715,729)	(925,266)	(72,697)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (5,660,498)	\$ (7,872,700)	\$ (3,549,214)	\$ (443,764)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 76,785,067	\$ 98,699,949	\$ 32,165,002	\$ 4,199,281
Current discount rate (7.15%).....	\$ 59,360,735	\$ 76,302,617	\$ 24,866,009	\$ 3,246,366
1% increase (8.15%).....	\$ 44,685,481	\$ 57,438,965	\$ 18,718,595	\$ 2,443,794
Covered Payroll.....	\$ 21,737,198	\$ 25,210,625	\$ 14,699,280	\$ 1,246,732
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, 2021

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 315,580	\$ 1,612,020	\$ 2,016,950	\$ 24,164
Ending net pension liability/(asset).....	\$ 255,587	\$ 1,042,229	\$ 1,656,493	\$ (1,005,744)
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 4,356	\$ 17,762	\$ 28,231	\$ (17,140)
Changes of assumptions.....	9,101	37,110	58,982	(35,811)
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	478	51,504	34,021	137,703
Total Deferred Outflows of Resources.....	\$ 13,935	\$ 106,376	\$ 121,234	\$ 84,752
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 43,457	\$ 177,208	\$ 281,650	\$ (171,005)
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	24,585	335,044	111,642	1,053,282
Total Deferred Inflows of Resources.....	\$ 68,042	\$ 512,252	\$ 393,292	\$ 882,277
Pension Expense				
Proportionate share of plan pension expense.....	\$ 21,404	\$ 87,278	\$ 138,715	\$ (84,224)
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(6,054)	(65,098)	152,538	(191,293)
Total Employer Pension Expense.....	\$ 15,350	\$ 22,180	\$ 291,253	\$ (275,517)
Contributions				
Statutory required contribution.....	\$ 28,862	\$ 130,292	\$ 248,780	\$ 70,601
Contribution in relation to statutory required contribution.....	(28,862)	(130,292)	(248,780)	(70,601)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	23.86%	33.67%	8.04%	4.57%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (11,104)	\$ (83,024)	\$ (30,816)	\$ (150,403)
June 30, 2024.....	(16,712)	(94,270)	(98,083)	(267,921)
June 30, 2025.....	(14,856)	(119,348)	(87,072)	(207,483)
June 30, 2026.....	(11,435)	(109,234)	(56,087)	(171,718)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (54,107)	\$ (405,876)	\$ (272,058)	\$ (797,525)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 330,610	\$ 1,348,158	\$ 2,142,728	\$ (1,300,963)
Current discount rate (7.15%).....	\$ 255,587	\$ 1,042,229	\$ 1,656,493	\$ (1,005,744)
1% increase (8.15%).....	\$ 192,400	\$ 784,568	\$ 1,246,972	\$ (757,102)
Covered Payroll.....	\$ 120,957	\$ 386,955	\$ 3,092,974	\$ 1,544,300
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, 2021

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 2,264,513	\$ 3,240,627	\$ 366,619	\$ 649,547
Ending net pension liability/(asset).....	\$ 1,703,681	\$ 3,204,541	\$ 183,163	\$ 465,506
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 29,035	\$ 54,613	\$ 3,122	\$ 7,933
Changes of assumptions.....	60,662	114,103	6,522	16,575
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	18,316	255,912	7,870	24,008
Total Deferred Outflows of Resources.....	\$ 108,013	\$ 424,628	\$ 17,514	\$ 48,516
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 289,674	\$ 544,862	\$ 31,143	\$ 79,149
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	290,811	56,010	117,389	111,666
Total Deferred Inflows of Resources.....	\$ 580,485	\$ 600,872	\$ 148,532	\$ 190,815
Pension Expense				
Proportionate share of plan pension expense.....	\$ 142,670	\$ 268,354	\$ 15,337	\$ 38,982
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(62,397)	94,931	(23,272)	(23,007)
Total Employer Pension Expense.....	\$ 80,273	\$ 363,285	\$ (7,935)	\$ 15,975
Contributions				
Statutory required contribution.....	\$ 170,394	\$ 252,748	\$ 37,612	\$ 58,341
Contribution in relation to statutory required contribution.....	(170,394)	(252,748)	(37,612)	(58,341)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	41.32%	40.36%	17.52%	14.76%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (108,543)	\$ (27,177)	\$ (25,964)	\$ (17,251)
June 30, 2024.....	(120,880)	(68,172)	(35,486)	(43,180)
June 30, 2025.....	(130,093)	(59,117)	(36,627)	(47,219)
June 30, 2026.....	(112,856)	(21,778)	(32,941)	(34,649)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (472,472)	\$ (176,244)	\$ (131,018)	\$ (142,299)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 2,203,768	\$ 4,145,179	\$ 236,927	\$ 602,147
Current discount rate (7.15%).....	\$ 1,703,681	\$ 3,204,541	\$ 183,163	\$ 465,506
1% increase (8.15%).....	\$ 1,282,494	\$ 2,412,309	\$ 137,881	\$ 350,423
Covered Payroll.....	\$ 412,422	\$ 626,182	\$ 214,654	\$ 395,169
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, 2021

	Greater Lowell Regional Vocation Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 17,820,793	\$ 12,381,614	\$ 616,643	\$ 8,715,281
Ending net pension liability/(asset).....	\$ 17,260,795	\$ 11,406,839	\$ 568,228	\$ 8,307,816
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 294,167	\$ 194,401	\$ 9,684	\$ 141,586
Changes of assumptions.....	614,597	406,158	20,233	295,813
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,446,808	669,010	22,520	493,356
Total Deferred Outflows of Resources.....	\$ 2,355,572	\$ 1,269,569	\$ 52,437	\$ 930,755
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 2,934,819	\$ 1,939,482	\$ 96,615	\$ 1,412,562
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	107,491	82,794	191,777	187,046
Total Deferred Inflows of Resources.....	\$ 3,042,310	\$ 2,022,276	\$ 288,392	\$ 1,599,608
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,445,444	\$ 955,224	\$ 47,584	\$ 695,708
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	451,134	295,624	(140,304)	56,763
Total Employer Pension Expense.....	\$ 1,896,578	\$ 1,250,848	\$ (92,720)	\$ 752,471
Contributions				
Statutory required contribution.....	\$ 1,453,154	\$ 1,173,066	\$ 58,322	\$ 756,986
Contribution in relation to statutory required contribution.....	(1,453,154)	(1,173,066)	(58,322)	(756,986)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	30.69%	27.72%	13.77%	25.29%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ 65,263	\$ 46,428	\$ (100,955)	\$ (115,961)
June 30, 2024.....	(211,852)	(265,868)	(107,073)	(257,546)
June 30, 2025.....	(367,974)	(340,924)	(18,351)	(196,364)
June 30, 2026.....	(172,175)	(192,343)	(9,576)	(98,982)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (686,738)	\$ (752,707)	\$ (235,955)	\$ (668,853)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 22,327,407	\$ 14,755,122	\$ 735,022	\$ 10,746,434
Current discount rate (7.15%).....	\$ 17,260,795	\$ 11,406,839	\$ 568,228	\$ 8,307,816
1% increase (8.15%).....	\$ 12,993,554	\$ 8,586,822	\$ 427,750	\$ 6,253,945
Covered Payroll.....	\$ 4,734,333	\$ 4,231,955	\$ 423,443	\$ 2,993,714
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, 2021

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 3,650,910	\$ 977,691	\$ 12,806,518	\$ 8,542,800
Ending net pension liability/(asset).....	\$ 3,439,271	\$ 628,790	\$ 11,254,512	\$ 8,099,773
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 58,614	\$ 10,716	\$ 191,805	\$ 138,040
Changes of assumptions.....	122,461	22,389	400,734	288,405
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	225,799	18,806	80,780	444,986
Total Deferred Outflows of Resources.....	\$ 406,874	\$ 51,911	\$ 673,319	\$ 871,431
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 584,772	\$ 106,912	\$ 1,913,583	\$ 1,377,188
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	40,422	247,901	27,663	32,627
Total Deferred Inflows of Resources.....	\$ 625,194	\$ 354,813	\$ 1,941,246	\$ 1,409,815
Pension Expense				
Proportionate share of plan pension expense.....	\$ 288,008	\$ 52,655	\$ 942,468	\$ 678,286
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	59,612	(34,445)	(1,235)	(14,567)
Total Employer Pension Expense.....	\$ 347,620	\$ 18,210	\$ 941,233	\$ 663,719
Contributions				
Statutory required contribution.....	\$ 327,120	\$ 78,589	\$ 1,219,851	\$ 723,882
Contribution in relation to statutory required contribution.....	(327,120)	(78,589)	(1,219,851)	(723,882)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	31.50%	13.61%	21.04%	24.28%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (36,775)	\$ (58,947)	\$ (148,808)	\$ (48,876)
June 30, 2024.....	(65,380)	(90,373)	(389,528)	(184,656)
June 30, 2025.....	(69,335)	(86,648)	(424,089)	(196,354)
June 30, 2026.....	(46,830)	(66,934)	(295,502)	(108,498)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (218,320)	\$ (302,902)	\$ (1,267,927)	\$ (538,384)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 4,448,810	\$ 813,361	\$ 14,558,082	\$ 10,477,323
Current discount rate (7.15%).....	\$ 3,439,271	\$ 628,790	\$ 11,254,512	\$ 8,099,773
1% increase (8.15%).....	\$ 2,589,009	\$ 473,340	\$ 8,472,154	\$ 6,097,334
Covered Payroll.....	\$ 1,038,502	\$ 577,414	\$ 5,799,083	\$ 2,981,397
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, 2021

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 6,677,782	\$ 2,449,672	\$ 1,645,758	\$ 625,875
Ending net pension liability/(asset).....	\$ 6,194,749	\$ 1,399,802	\$ 1,475,444	\$ 371,407
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 105,574	\$ 23,856	\$ 25,145	\$ 6,330
Changes of assumptions.....	220,574	49,842	52,535	13,225
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	244,125	162,541	24,420	6,105
Total Deferred Outflows of Resources.....	\$ 570,273	\$ 236,239	\$ 102,100	\$ 25,660
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 1,053,281	\$ 238,006	\$ 250,867	\$ 63,150
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	137,991	715,804	13,101	184,183
Total Deferred Inflows of Resources.....	\$ 1,191,272	\$ 953,810	\$ 263,968	\$ 247,333
Pension Expense				
Proportionate share of plan pension expense.....	\$ 518,757	\$ 117,223	\$ 123,557	\$ 31,102
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(137,550)	(150,161)	6,208	(48,108)
Total Employer Pension Expense.....	\$ 381,207	\$ (32,938)	\$ 129,765	\$ (17,006)
Contributions				
Statutory required contribution.....	\$ 580,201	\$ 178,572	\$ 142,280	\$ 57,807
Contribution in relation to statutory required contribution.....	(580,201)	(178,572)	(142,280)	(57,807)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.69%	17.89%	29.34%	17.36%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (100,619)	\$ (114,909)	\$ (23,442)	\$ (52,982)
June 30, 2024.....	(232,161)	(163,940)	(48,629)	(66,541)
June 30, 2025.....	(181,673)	(235,730)	(54,169)	(55,201)
June 30, 2026.....	(106,546)	(202,992)	(35,628)	(46,949)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (620,999)	\$ (717,571)	\$ (161,868)	\$ (221,673)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 8,013,112	\$ 1,810,690	\$ 1,908,535	\$ 480,427
Current discount rate (7.15%).....	\$ 6,194,749	\$ 1,399,802	\$ 1,475,444	\$ 371,407
1% increase (8.15%).....	\$ 4,663,273	\$ 1,053,741	\$ 1,110,682	\$ 279,587
Covered Payroll.....	\$ 2,258,149	\$ 998,296	\$ 484,993	\$ 332,528
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2021

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 517,677	\$ 465,613	\$ 370,673	\$ 861,176
Ending net pension liability/(asset).....	\$ 498,319	\$ 458,401	\$ 185,577	\$ 721,454
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 8,493	\$ 7,812	\$ 3,163	\$ 12,295
Changes of assumptions.....	17,743	16,322	6,608	25,688
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	35,164	40,584	6,243	16,337
Total Deferred Outflows of Resources.....	\$ 61,400	\$ 64,718	\$ 16,014	\$ 54,320
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 84,728	\$ 77,941	\$ 31,553	\$ 122,667
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,914	4,303	115,318	42,075
Total Deferred Inflows of Resources.....	\$ 86,642	\$ 82,244	\$ 146,871	\$ 164,742
Pension Expense				
Proportionate share of plan pension expense.....	\$ 41,729	\$ 38,387	\$ 15,538	\$ 60,416
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,043)	18,865	(23,145)	(42,956)
Total Employer Pension Expense.....	\$ 40,686	\$ 57,252	\$ (7,607)	\$ 17,460
Contributions				
Statutory required contribution.....	\$ 43,799	\$ 43,182	\$ 35,519	\$ 77,609
Contribution in relation to statutory required contribution.....	(43,799)	(43,182)	(35,519)	(77,609)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	35.01%	27.40%	56.04%	16.24%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ 1,206	\$ 415	\$ (29,369)	\$ (11,816)
June 30, 2024.....	(10,045)	(8,403)	(32,859)	(33,108)
June 30, 2025.....	(11,164)	(7,416)	(34,892)	(38,379)
June 30, 2026.....	(5,239)	(2,122)	(33,737)	(27,119)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (25,242)	\$ (17,526)	\$ (130,857)	\$ (110,422)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 644,592	\$ 592,957	\$ 240,050	\$ 933,225
Current discount rate (7.15%).....	\$ 498,319	\$ 458,401	\$ 185,577	\$ 721,454
1% increase (8.15%).....	\$ 375,124	\$ 345,074	\$ 139,698	\$ 543,095
Covered Payroll.....	\$ 125,114	\$ 157,571	\$ 63,386	\$ 477,825
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, 2021

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 327,467	\$ 858,485	\$ 168,599	\$ 607,838
Ending net pension liability/(asset).....	\$ 4,057	\$ 691,363	\$ 93,451	\$ 665,340
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 69	\$ 11,783	\$ 1,593	\$ 11,339
Changes of assumptions.....	144	24,617	3,327	23,690
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	75,912	15,654	7,322	141,102
Total Deferred Outflows of Resources.....	\$ 76,125	\$ 52,054	\$ 12,242	\$ 176,131
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 690	\$ 117,551	\$ 15,889	\$ 113,126
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	241,805	72,062	41,832	3,524
Total Deferred Inflows of Resources.....	\$ 242,495	\$ 189,633	\$ 57,721	\$ 116,650
Pension Expense				
Proportionate share of plan pension expense.....	\$ 339	\$ 57,896	\$ 7,825	\$ 55,716
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(15,922)	(214,539)	(19,696)	43,282
Total Employer Pension Expense.....	\$ (15,583)	\$ (156,643)	\$ (11,871)	\$ 98,998
Contributions				
Statutory required contribution.....	\$ 35,290	\$ 66,830	\$ 19,951	\$ 48,297
Contribution in relation to statutory required contribution.....	(35,290)	(66,830)	(19,951)	(48,297)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	16.16%	33.75%	23.14%	#DIV/0!
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (16,834)	\$ (28,936)	\$ (7,551)	\$ 30,413
June 30, 2024.....	(30,214)	(33,326)	(11,254)	20,584
June 30, 2025.....	(61,524)	(41,167)	(13,715)	823
June 30, 2026.....	(57,788)	(34,150)	(12,959)	7,661
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (166,370)	\$ (137,579)	\$ (45,479)	\$ 59,481
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 5,248	\$ 894,301	\$ 120,882	\$ 860,639
Current discount rate (7.15%).....	\$ 4,057	\$ 691,363	\$ 93,451	\$ 665,340
1% increase (8.15%).....	\$ 3,054	\$ 520,443	\$ 70,348	\$ 500,854
Covered Payroll.....	\$ 218,402	\$ 198,031	\$ 86,205	\$ -
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, 2021

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 537,128	\$ 453,772	\$ 516,453	\$ 247,338
Ending net pension liability/(asset).....	\$ 285,368	\$ 310,034	\$ 504,387	\$ 212,725
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 4,863	\$ 5,284	\$ 8,596	\$ 3,625
Changes of assumptions.....	10,161	11,039	17,959	7,574
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	21,480	46,081	21,097
Total Deferred Outflows of Resources.....	\$ 15,024	\$ 37,803	\$ 72,636	\$ 32,296
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 48,521	\$ 52,714	\$ 85,760	\$ 36,169
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	157,431	93,820	7,839	3,939
Total Deferred Inflows of Resources.....	\$ 205,952	\$ 146,534	\$ 93,599	\$ 40,108
Pension Expense				
Proportionate share of plan pension expense.....	\$ 23,897	\$ 25,961	\$ 42,238	\$ 17,815
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(33,256)	(17,914)	13,081	11,245
Total Employer Pension Expense.....	\$ (9,359)	\$ 8,047	\$ 55,319	\$ 29,060
Contributions				
Statutory required contribution.....	\$ 53,528	\$ 36,292	\$ 47,279	\$ 24,032
Contribution in relation to statutory required contribution.....	(53,528)	(36,292)	(47,279)	(24,032)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	20.20%	15.81%	26.28%	24.64%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ (45,319)	\$ (17,003)	\$ (2,037)	\$ 5,080
June 30, 2024.....	(50,263)	(27,553)	(8,801)	1,729
June 30, 2025.....	(49,830)	(36,348)	(6,917)	(8,173)
June 30, 2026.....	(45,516)	(27,827)	(3,208)	(6,448)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (190,928)	\$ (108,731)	\$ (20,963)	\$ (7,812)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ 369,133	\$ 401,039	\$ 652,441	\$ 275,167
Current discount rate (7.15%).....	\$ 285,368	\$ 310,034	\$ 504,387	\$ 212,725
1% increase (8.15%).....	\$ 214,819	\$ 233,387	\$ 379,692	\$ 160,135
Covered Payroll.....	\$ 265,045	\$ 229,540	\$ 179,917	\$ 97,538
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, 2021

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ 440,581	\$ 212,881	\$ 18,060
Ending net pension liability/(asset).....	\$ -	\$ 370,151	\$ 26,035	\$ (39,887)
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 6,308	\$ 444	\$ (680)
Changes of assumptions.....	\$ -	\$ 13,180	\$ 927	\$ (1,420)
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 8,244	\$ 9,051	\$ 23,015	\$ 2,149
Total Deferred Outflows of Resources.....	\$ 8,244	\$ 28,539	\$ 24,386	\$ 49
Deferred Inflows of Resources				
Net difference between projected and actual investment earnings on pension plan investments.....	\$ -	\$ 62,936	\$ 4,427	\$ (6,782)
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ -	\$ 23,708	\$ 131,128	\$ 55,970
Total Deferred Inflows of Resources.....	\$ -	\$ 86,644	\$ 135,555	\$ 49,188
Pension Expense				
Proportionate share of plan pension expense.....	\$ -	\$ 30,996	\$ 2,179	\$ (3,342)
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 546	\$ (3,199)	\$ (21,538)	\$ (11,521)
Total Employer Pension Expense.....	\$ 546	\$ 27,797	\$ (19,359)	\$ (14,863)
Contributions				
Statutory required contribution.....	\$ -	\$ 43,481	\$ 22,357	\$ 2,709
Contribution in relation to statutory required contribution.....	\$ -	\$ (43,481)	\$ (22,357)	\$ (2,709)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	0.00%	18.69%	36.50%	1.40%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2023.....	\$ 4,832	\$ (4,877)	\$ (21,471)	\$ (12,289)
June 30, 2024.....	\$ 2,839	\$ (19,573)	\$ (23,712)	\$ (13,638)
June 30, 2025.....	\$ 573	\$ (20,726)	\$ (32,507)	\$ (12,959)
June 30, 2026.....	\$ -	\$ (12,929)	\$ (33,479)	\$ (10,253)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 8,244	\$ (58,105)	\$ (111,169)	\$ (49,139)
Discount Rate Sensitivity				
1% decrease (6.15%).....	\$ -	\$ 478,803	\$ 33,677	\$ (51,595)
Current discount rate (7.15%).....	\$ -	\$ 370,151	\$ 26,035	\$ (39,887)
1% increase (8.15%).....	\$ -	\$ 278,642	\$ 19,599	\$ (30,026)
Covered Payroll.....	\$ -	\$ 232,657	\$ 61,252	\$ 193,409
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, 2021

	Ayer-Shirley Regional School District	Northern Middlesex Regional Emergency Communications Center	Totals
Net Pension Liability			
Beginning net pension liability/(asset).....	\$ 4,239,976	\$ (14,725)	\$ 1,531,093,126
Ending net pension liability/(asset).....	\$ 2,097,697	\$ 328,026	\$ 1,340,727,512
Deferred Outflows of Resources			
Differences between expected and actual experience.....	\$ 35,750	\$ 5,590	\$ 22,849,362
Changes of assumptions.....	74,692	11,680	47,738,660
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	105,858	283,044	38,895,800
Total Deferred Outflows of Resources.....	\$ 216,300	\$ 300,314	\$ 109,483,822
Deferred Inflows of Resources			
Net difference between projected and actual investment earnings on pension plan investments.....	\$ 356,667	\$ 55,774	\$ 227,961,260
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,507,225	7,839	38,895,800
Total Deferred Inflows of Resources.....	\$ 1,863,892	\$ 63,613	\$ 266,857,060
Pension Expense			
Proportionate share of plan pension expense.....	\$ 175,664	\$ 27,474	\$ 112,703,191
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(393,228)	68,149	-
Total Employer Pension Expense.....	\$ (217,564)	\$ 95,623	\$ 112,703,191
Contributions			
Statutory required contribution.....	\$ 513,767	\$ -	\$ 144,255,207
Contribution in relation to statutory required contribution.....	(513,767)	-	(147,852,245)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (3,597,038)
Contributions as a percentage of covered payroll.....	12.60%	0.00%	28.47%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense			
June 30, 2023.....	\$ (354,951)	\$ 62,706	\$ (22,243,804)
June 30, 2024.....	(502,908)	56,122	(49,152,268)
June 30, 2025.....	(420,813)	55,891	(50,098,614)
June 30, 2026.....	(368,919)	61,982	(35,878,552)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (1,647,592)	\$ 236,701	\$ (157,373,238)
Discount Rate Sensitivity			
1% decrease (6.15%).....	\$ 2,713,437	\$ 424,312	\$ 1,734,275,212
Current discount rate (7.15%).....	\$ 2,097,697	\$ 328,026	\$ 1,340,727,512
1% increase (8.15%).....	\$ 1,579,101	\$ 246,931	\$ 1,009,270,759
Covered Payroll.....	\$ 4,076,791	\$ 923,210	\$ 519,239,589
See notes to schedule of employer allocations and schedule of pension amounts by employer.			(Concluded)

NOTE A – 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 MCRS has elected to use an actuarial based allocation methodology. Accordingly, each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the MCRS'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 on 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 Middlesex Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2018, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the MCRS'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 MCRS have been identified and their total pension liability has been actuarially determined. For transparency purposes, the MCRS 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 MCRS's funding schedule. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE B – 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.

The following assumption changes were reflected in the January 1, 2022 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.30% to 7.15%.
- The mortality projection scale was updated from MP-2017 to MP-2021.

Changes in Plan Provisions

- None.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2020

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2020

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Financial Section

Middlesex County Retirement System

1

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 as of and for the year ended December 31, 2020, 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, 2020, and the results of its operations and changes in its financial position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters*Required Supplementary Information*

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

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated July 13, 2021 on our consideration of the Middlesex County Retirement System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, grant agreements and other matters. The purpose of that report is to describe the scope of our testing of internal control over financial reporting and compliance and the results of that testing, and not to provide an opinion on the internal control over financial reporting or on compliance. That report is an integral part of an audit performed in accordance with *Government Auditing Standards* in considering the Middlesex County Retirement System's internal control over financial reporting and compliance.

Restriction on Use

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



July 13, 2021

Management's Discussion and Analysis

As management of the Middlesex County Retirement System (MCRS), we offer readers of these financial statements this narrative overview and analysis of the financial activities for the year ended December 31, 2020. The MCRS 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 MCRS's assets exceeded its liabilities at the close of the most recent year by \$1.8 billion (net position).
- The MCRS's net position increased by \$190.6 million for the year ended December 31, 2020.
- Total investment income was \$192.9 million; investment expenses were \$7.4 million; and net investment income was \$185.4 million.
- Total contributions were \$196.5 million, primarily consisting of \$138.3 million from employers, \$51 million from members, \$5.2 million in transfers from other systems and \$2 million in other contributions.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$188 million.
- Depreciation, administrative and building expenses were \$3.3 million.
- The total pension liability was \$3.3 billion as of December 31, 2020, while the net pension liability was \$1.5 billion.
- The Plan fiduciary net position as a percentage of the total pension liability was 53.42%.

Overview of the Financial Statements

This discussion and analysis is intended to serve as an introduction to the MCRS's 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 fiduciary 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 MCRS'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 MCRS's financial position. The MCRS's assets exceeded liabilities by \$1.8 billion at the close of 2020.

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 MCRS's net position included investments of \$1.7 billion, cash of \$41.1 million and current accounts receivable of \$4.4 million. The system also had capital assets, net of accumulated depreciation, of \$4.4 million at year-end primarily consisting of land, an office building, and building improvements.

In 2020, the MCRS's contributions were \$196.5 million while deductions were \$191.3 million which resulted in a current surplus of \$5.2 million. In 2019, the MCRS's contributions were \$189 million while deductions were \$181.8 million which resulted in a prior year surplus of \$7.2 million. Therefore, for these two years the MCRS 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 \$185.4 million in 2020, and \$208.3 million in 2019. The annual money weighted rate of return was 12.26% and 16.21% in 2020, and 2019, respectively. The MCRS's investment policy is designed to achieve a long-term rate of return of 7.30% and fluctuation in annual investment returns is expected.

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

	2020	2019
Assets:		
Cash.....	\$ 41,101,439	\$ 40,093,110
Investments.....	1,706,314,629	1,512,849,318
Receivables.....	4,435,670	8,110,976
Capital assets, net of accumulated depreciation....	4,429,195	4,722,962
Total assets.....	1,756,280,933	1,565,776,366
Liabilities:		
Accounts payable.....	115,997	142,242
Other liabilities.....	26,606	105,862
Total liabilities.....	142,603	248,104
Net Position Restricted for Pensions.....	\$ 1,756,138,330	\$ 1,565,528,262

	<u>2020</u>	<u>2019</u>
Additions:		
Contributions:		
Member contributions..... \$	50,973,950	\$ 48,445,698
Employer contributions.....	138,327,737	129,763,555
Other contributions.....	<u>7,185,413</u>	<u>10,764,996</u>
Total contributions.....	<u>196,487,100</u>	<u>188,974,249</u>
Net investment income:		
Total investment income.....	192,871,896	215,642,272
Less, investment expenses.....	<u>(7,442,169)</u>	<u>(7,319,761)</u>
Net investment income.....	<u>185,429,727</u>	<u>208,322,511</u>
Total additions.....	<u>381,916,827</u>	<u>397,296,760</u>
Deductions:		
Administration.....	2,781,367	2,754,384
Retirement benefits, refunds and transfers.....	187,995,148	178,455,859
Building operations and maintenance.....	208,858	279,208
Depreciation.....	<u>321,386</u>	<u>318,812</u>
Total deductions.....	<u>191,306,759</u>	<u>181,808,263</u>
Net increase (decrease) in fiduciary net position....	190,610,068	215,488,497
Fiduciary net position at beginning of year.....	<u>1,565,528,262</u>	<u>1,350,039,765</u>
Fiduciary net position at end of year..... \$	<u><u>1,756,138,330</u></u>	<u><u>1,565,528,262</u></u>

Requests for Information

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

STATEMENT OF FIDUCIARY NET POSITION

DECEMBER 31, 2020

Assets	
Cash and cash equivalents.....	\$ 41,101,439
Investments:	
Investments in Pension Reserve Investment Trust...	1,699,992,348
Pooled alternative investments.....	4,436,774
Pooled real estate funds.....	<u>1,885,507</u>
Total investments.....	<u>1,706,314,629</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	3,798,949
Member contributions.....	11,581
Employer pension appropriation.....	21,678
Member make-up payments and redeposits.....	181,472
Transfers from other systems.....	319,912
Other accounts receivable.....	<u>102,059</u>
Total Receivables.....	<u>4,435,651</u>
Interest and dividends.....	19
Capital assets, net of accumulated depreciation.....	<u>4,429,195</u>
Total Assets.....	<u>1,756,280,933</u>
Liabilities	
Accounts payable.....	115,997
Other liabilities.....	<u>26,606</u>
Total Liabilities.....	<u>142,603</u>
Net Position Restricted for Pensions.....	\$ <u>1,756,138,330</u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2020

Additions:	
Contributions:	
Employer pension appropriation.....	\$ 138,290,237
Member contributions.....	50,973,950
Transfers from other systems.....	5,197,904
3(8)(c) contributions from other systems.....	614,954
Workers' compensation settlements.....	37,500
Retirement benefits - state COLA reimbursements.....	375,346
Members' makeup payments and redeposits.....	859,010
Interest not refunded.....	<u>138,199</u>
 Total contributions.....	 <u>196,487,100</u>
Net investment income:	
Investment income.....	192,871,896
Less: investment expense.....	<u>(7,442,169)</u>
 Net investment income.....	 <u>185,429,727</u>
 Total additions.....	 <u>381,916,827</u>
Deductions:	
Administration.....	2,781,367
Building operations and maintenance.....	208,858
Retirement benefits and refunds.....	171,634,862
Transfers to other systems.....	4,377,320
3(8)(c) transfer to other systems.....	11,982,966
Depreciation.....	<u>321,386</u>
 Total deductions.....	 <u>191,306,759</u>
 Net increase (decrease) in fiduciary net position.....	 190,610,068
 Fiduciary net position at beginning of year.....	 <u>1,565,528,262</u>
 Fiduciary net position at end of year.....	 <u>\$ 1,756,138,330</u>

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System (MCRS) is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week and who are paid annual compensation of no less than \$5,000. As of January 1, 2020, the MCRS had 71 participating employers.

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

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

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

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

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

Administrative expenses are paid from investment income.

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

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

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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

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

Cash and Investments

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

Fair Value Measurements

The MCRS 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 MCRS'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 MCRS 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:	12/31/2026
Advisory Council Member.....	Brian P. Curtin	Term Expires:	12/31/2021
Elected Member.....	John Brown	Term Expires:	12/31/2023
Elected Member.....	Joseph W. Kearns	Term Expires:	12/31/2022
Appointed Member.....	Robert W. Healy, Jr.	Term Expires:	12/16/2025

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 MCRS. The Board must annually file a financial statement of condition

for the MCRS with the Executive Director of PERAC.

The investment of the MCRS'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 MCRS has obtained a waiver for superannuation calculations allowing them to bypass this requirement. All expenses incurred by the MCRS 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, 2020, the carrying amount of the MCRS's deposits totaled \$33,445,095, and the bank balance totaled \$39,406,777, all of which was covered by Federal Depository Insurance.

Investments

The MCRS's investments were as follows:

<u>Investment Type</u>	<u>December 31, 2020</u>
PRIT Pooled Funds.....	\$ 1,699,992,348
Money Market Mutual Funds.....	7,656,344
Pooled Alternative Investments...	4,436,774
Pooled Real Estate Funds.....	1,885,507
Total Investments.....	<u>\$ 1,713,970,973</u>

Approximately 99.2% of the Retirement MCRS'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. The effective weighted duration rate for PRIT investments ranged from 0.19 to 16.28 years.

Approximately 0.4% of the MCRS's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 0.4% of the MCRS'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 12.26%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Value of Investments

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

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

The MCRS had the following recurring fair value measurements as of December 31, 2020:

Investment Type	12/31/2020	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:				
Money Market Mutual Funds.....	\$ 7,656,344	\$ 7,656,344	\$ -	\$ -
Pooled Alternative Investments.....	4,436,774	-	-	4,436,774
Pooled Real Estate Funds.....	1,885,507	-	-	1,885,507
Total Investments by fair value level.....	13,978,625	\$ 7,656,344	\$ -	\$ 6,322,281
Investments measured at the net asset value (NAV):				
PRIT Investments.....	1,699,992,348			
Total Investments.....	\$ 1,713,970,973			

Money market mutual funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled alternative investments and pooled real estate funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method.

NOTE 6 – CAPITAL ASSETS

All purchases and building costs in excess of \$25,000 are capitalized at the date of acquisition. Capital assets are depreciated on a straight-line basis. The estimated useful lives of capital assets are as follows:

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements.....	40
Vehicles.....	5
Software and equipment.....	5

Capital asset activity for the year ended December 31, 2020, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,099,492	-	-	1,099,492
Vehicles.....	30,913	-	-	30,913
Software and equipment.....	729,570	27,619	-	757,189
Total capital assets being depreciated.....	7,277,111	27,619	-	7,304,730
<u>Less accumulated depreciation for:</u>				
Buildings.....	(2,306,638)	(135,428)	-	(2,442,066)
Building improvements.....	(461,817)	(29,740)	-	(491,557)
Vehicles.....	(20,608)	(10,304)	-	(30,912)
Software and equipment.....	(437,743)	(145,914)	-	(583,657)
Total accumulated depreciation.....	(3,226,806)	(321,386)	-	(3,548,192)
Total capital assets being depreciated, net.....	4,050,305	(293,767)	-	3,756,538
Total capital assets, net.....	\$ 4,722,962	\$ (293,767)	\$ -	\$ 4,429,195

NOTE 7 – MEMBERSHIP

The following table represents the MCRS's membership at December 31, 2019:

Active members.....	9,282
Inactive members entitled to a return of their employee contributions.....	3,082
Inactive members with a vested right to a deferred or immediate benefit.....	381
Retirees and beneficiaries currently receiving benefits.....	<u>5,862</u>
Total.....	<u>18,607</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2020, were as follows:

Total pension liability.....	\$ 3,287,231,456
The pension plan's fiduciary net position.....	<u>1,756,138,330</u>
The net pension liability.....	\$ <u>1,531,093,126</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	53.42%

The total pension liability was determined by an actuarial valuation as of January 1, 2020, using the following actuarial assumptions, applied to all periods included in the measurement that was rolled forward to December 31, 2020:

Valuation date.....	January 1, 2020.
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.50% for fiscal 2022 through fiscal 2028, and thereafter the remaining unfunded liability will be amortized on a 4.00% annual increasing basis; ERI liability amortized in level payments.
Remaining amortization period.....	17 years from July 1, 2018, for non-ERI liability, 1 year from July 1, 2018, for 2002 ERI, 2 years from July 1, 2018, for 2033 ERI, and 4 years from July 1, 2018, for 2010 ERI.
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.
Investment rate of return/Discount rate..	7.30%, net of pension plan investment expense, including inflation

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.....	3.00% of the first \$16,000 of retirement income.
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 policy: The MCRS'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 MCRS's target asset allocation as of December 31, 2020, are summarized in the following table:

Asset Class	Long-Term Expected Asset Allocation	Long-Term Expected Real Rate of Return
Domestic equity.....	22.00%	6.28%
International developed markets equity.....	12.00%	7.00%
International emerging markets equity.....	5.00%	8.82%
Core fixed income.....	15.00%	0.38%
High-yield fixed income.....	8.00%	2.97%
Real estate.....	10.00%	3.50%
Timber.....	4.00%	3.45%
Hedge funds, GTAA, risk parity.....	10.00%	2.35%
Private equity.....	14.00%	10.11%
	100.00%	

Discount rate: The discount rate used to measure the total pension liability was 7.30%. 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 MCRS's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the net pension liability to changes in the discount rate. The following presents the net pension liability, calculated using the discount rate of 7.30%, as well as what the net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.30%) or 1-percentage-point higher (8.30%) than the current rate:

	1% Decrease (6.30%)	Current Discount (7.30%)	1% Increase (8.30%)
Middlesex County Retirement System's net pension liability as of December 31, 2020.....	\$ 1,907,916,916	\$ 1,531,093,126	\$ 1,214,072,425

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.

In December 2020, the SERS and MCRS finalized the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld; a final payment of \$4,104,146 was made from the MCRS to the SERS to resolve the issue. Further, MCRS began to receive COLA payments from the state in December 2020.

NOTE 10 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

There were no GASB pronouncements required to be implemented in 2020 that impacted the MCRS's financial statements.

None of the issued GASB statements that are required to be implemented in future years are anticipated to impact the MCRS's financial statements.

NOTE 11 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through July 13, 2021, which is the date the financial statements were available to be issued.

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Required Supplementary Information

Middlesex County Retirement System

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Required Supplementary Information

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

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

	December 31, 2018	December 31, 2019	December 31, 2020
\$	64,615,910	\$ 66,816,001	\$ 73,591,385
	208,614,148	216,905,943	229,825,239
	-	29,156,339	-
	-	46,671,873	-
	-	65,013,900	-
	<u>(161,259,804)</u>	<u>(168,486,003)</u>	<u>(181,769,445)</u>
	111,970,254	256,078,053	121,647,179
	<u>2,797,535,970</u>	<u>2,909,506,224</u>	<u>3,165,584,277</u>
\$	<u>2,909,506,224</u>	<u>3,165,584,277</u>	<u>3,287,231,456</u>
\$	120,614,676	\$ 129,685,755	\$ 138,290,237
	45,984,957	48,445,698	50,973,950
	9,581,643	10,842,796	7,222,913
	(31,074,711)	208,322,511	185,429,727
	(2,645,568)	(2,754,384)	(2,781,367)
	(309,357)	(279,208)	(208,858)
	(161,259,804)	(168,486,003)	(181,769,445)
	(8,884,478)	(9,969,856)	(6,225,703)
	<u>(318,812)</u>	<u>(318,812)</u>	<u>(321,386)</u>
	(28,311,454)	215,488,497	190,610,068
	<u>1,378,351,219</u>	<u>1,350,039,765</u>	<u>1,565,528,262</u>
\$	<u>1,350,039,765</u>	<u>1,565,528,262</u>	<u>1,756,138,330</u>
\$	<u>1,559,466,459</u>	<u>1,600,056,015</u>	<u>1,531,093,126</u>
	46.40%	49.45%	53.42%
\$	471,115,185	\$ 492,109,775	\$ 513,201,283
	331.02%	325.14%	298.34%

SCHEDULE OF CONTRIBUTIONS

Year	Actuarially determined contribution	Contributions in relation to the actuarially determined contribution	Contribution deficiency (excess)	Covered payroll	Contributions as a percentage of covered payroll
December 31, 2020	\$ 135,472,822	\$ (138,290,237)	\$ (2,817,415)	\$ 513,201,283	26.95%
December 31, 2019	127,151,838	(129,685,754)	(2,533,916)	492,109,775	26.35%
December 31, 2018	119,298,291	(120,614,676)	(1,316,385)	471,115,185	25.60%
December 31, 2017	112,017,087	(115,426,815)	(3,409,728)	451,777,105	25.55%
December 31, 2016	105,246,797	(107,067,707)	(1,820,910)	439,644,322	24.35%
December 31, 2015	98,792,642	(99,820,481)	(1,027,839)	432,382,921	23.09%
December 31, 2014	92,826,743	(93,400,946)	(574,203)	415,752,810	22.47%

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

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, 2020.....	12.26%
December 31, 2019.....	16.21%
December 31, 2018.....	-2.52%
December 31, 2017.....	17.25%
December 31, 2016.....	7.35%
December 31, 2015.....	0.61%
December 31, 2014.....	7.54%

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

See notes to required supplementary information.

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

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

NOTE B – CONTRIBUTIONS

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

NOTE C – MONEY WEIGHTED RATE OF RETURN

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

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONS

The following changes were reflected in the January 1, 2020 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.50% to 7.30%.

Changes in Plan Provisions

- As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$16,000 as of July 1, 2019.

Audit of Specific Elements, Accounts and Items of Financial Statements

Middlesex County Retirement System

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*Audit of Specific Elements Accounts and
Items of Financial Statements*

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Independent Auditor's Report

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

We have audited the accompanying schedule of employer allocations of the Middlesex County Retirement System (MCRS) as of and for the year ended December 31, 2020, 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, 2020, 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, 2020, 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, 2020, and our report thereon, dated July 13, 2021, 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, appearing to read "Robert J. Sullivan" followed by three horizontal lines.

July 13, 2021

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2020

Employer	Share of Net Pension Liability	Percent of Total Net Pension Liability
Middlesex County Retirement Board.....	\$ -	0.00000%
Middlesex County.....	-	0.00000%
Middlesex Hospital.....	-	0.00000%
Town of Acton.....	52,615,628	3.436475%
Town of Ashby.....	1,775,392	0.115956%
Town of Ashland.....	35,887,576	2.343919%
Town of Ayer.....	19,150,544	1.250776%
Town of Bedford.....	51,394,381	3.356712%
Town of Billerica.....	152,215,238	9.941605%
Town of Boxborough.....	12,166,423	0.794623%
Town of Burlington.....	133,422,263	8.714183%
Town of Carlisle.....	10,349,764	0.675972%
Town of Chelmsford.....	110,931,084	7.245221%
Town of Dracut.....	66,580,110	4.348534%
Town of Dunstable.....	3,218,104	0.210183%
Town of Groton.....	24,595,262	1.606386%
Town of Holliston.....	25,050,502	1.636119%
Town of Hopkinton.....	24,095,505	1.573745%
Town of Hudson.....	66,148,477	4.320343%
Town of Lincoln.....	26,477,563	1.729324%
Town of Littleton.....	23,466,261	1.532648%
Town of North Reading.....	50,095,267	3.271853%
Town of Pepperell.....	17,612,899	1.150348%
Town of Sherborn.....	9,801,713	0.640177%
Town of Shirley.....	8,952,975	0.584744%
Town of Stow.....	11,389,407	0.743874%
Town of Sudbury.....	61,745,935	4.032801%
Town of Tewksbury.....	104,198,258	6.855481%
Town of Townsend.....	8,103,739	0.529222%
Town of Tyngsborough.....	24,002,922	1.567698%
Town of Wayland.....	56,416,777	3.684738%
Town of Westford.....	56,098,309	3.663938%
Town of Weston.....	64,849,395	4.235496%
Town of Wilmington.....	86,423,315	5.644550%
Acton-Boxborough Regional School District.....	30,083,545	1.964841%
Acton Water Supply.....	3,548,184	0.231742%
Bedford Housing Authority.....	315,580	0.020611%
Billerica Housing Authority.....	1,612,020	0.105286%
Chelmsford Housing Authority.....	2,016,950	0.131733%
Chelmsford Water District.....	24,164	0.001578%
Dracut Housing Authority.....	2,264,513	0.147902%
Dracut Water Supply.....	3,240,627	0.211654%
East Chelmsford Water District.....	366,619	0.023945%
East Middlesex Mosquito Control.....	649,547	0.042424%
Greater Lowell Regional Vocational Technical School District.....	17,820,733	1.163926%
Groton-Dunstable Regional School District.....	12,361,614	0.808678%
Hudson Housing Authority.....	616,643	0.040275%
Lincoln-Sudbury Regional School District.....	8,715,281	0.569220%
Nashoba Valley Technical High School District.....	3,650,910	0.238451%
North Chelmsford Water District.....	977,691	0.063856%
North Middlesex Regional School District.....	12,806,518	0.834303%
Shawshen Valley Regional Vocational School.....	8,542,800	0.557954%
South Middlesex Regional Vocational Technical School.....	6,677,782	0.436145%
Sudbury Water District.....	2,449,672	0.159995%
Tewksbury Housing Authority.....	1,645,758	0.107489%
Wayland Housing Authority.....	625,875	0.040878%
Hopkinton Housing Authority.....	517,877	0.033811%
Sudbury Housing Authority.....	465,613	0.030410%
Wilmington Housing Authority.....	370,673	0.024210%
Acton Housing Authority.....	861,176	0.056246%
Burlington Housing Authority.....	327,467	0.021388%
Ayer Housing Authority.....	858,485	0.056070%
Holliston Housing Authority.....	168,599	0.011012%
Littleton Housing Authority.....	607,838	0.039700%
Westford Housing Authority.....	537,126	0.035081%
Shirley Water District.....	453,772	0.029637%
Tyngsborough Housing Authority.....	516,453	0.033731%
Pepperell Housing Authority.....	247,338	0.016154%
Groton Housing Authority.....	-	0.00000%
Tyngsborough Water District.....	440,581	0.028776%
North Reading Housing Authority.....	212,881	0.013904%
West Groton Water.....	18,060	0.001180%
Ayer-Shirley Regional School District.....	4,239,976	0.276925%
Northern Middlesex Regional Emergency Communications Center.....	(14,725)	-0.000962%
Total.....	\$ 1,531,093,126	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, 2020

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 54,966,604
Ending net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 52,615,628
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 962,320
Changes of assumptions.....	-	-	-	2,008,534
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	374,225
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 3,345,079
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 62,265
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	2,982,703
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	195,119
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 3,240,087
Pension Expense				
Proportionate share of plan pension expense.....	\$ 356,333	\$ -	\$ -	\$ 6,017,439
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(221,259)
Total Employer Pension Expense.....	\$ 356,333	\$ -	\$ -	\$ 5,796,180
Contributions				
Statutory required contribution.....	\$ 356,333	\$ -	\$ -	\$ 4,615,717
Contribution in relation to statutory required contribution.....	(356,333)	-	-	(4,615,717)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.43%	0.00%	0.00%	30.36%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ -	\$ -	\$ -	\$ 704,028
June 30, 2023.....	-	-	-	425,042
June 30, 2024.....	-	-	-	(514,077)
June 30, 2025.....	-	-	-	(510,001)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 104,992
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ -	\$ -	\$ -	\$ 65,564,739
Current discount rate (7.30%).....	\$ -	\$ -	\$ -	\$ 52,615,628
1% increase (8.30%).....	\$ -	\$ -	\$ -	\$ 41,721,292
Covered Payroll.....	\$ 1,401,093	\$ -	\$ -	\$ 15,204,987
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, 2020

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 1,941,210	\$ 37,703,972	\$ 20,395,526	\$ 54,291,514
Ending net pension liability/(asset).....	\$ 1,775,392	\$ 35,887,576	\$ 19,150,544	\$ 51,394,381
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 32,471	\$ 656,370	\$ 350,256	\$ 939,984
Changes of assumptions.....	67,773	1,369,962	731,047	1,961,914
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	149,757	723,399	290,191	188,088
Total Deferred Outflows of Resources.....	\$ 250,001	\$ 2,749,731	\$ 1,371,494	\$ 3,089,986
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 2,101	\$ 42,469	\$ 22,663	\$ 60,819
Net difference between projected and actual investment earnings on pension plan investments.....	100,644	2,034,414	1,085,616	2,913,472
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	103,740	141,568	212,355	1,639,291
Total Deferred Inflows of Resources.....	\$ 206,485	\$ 2,218,451	\$ 1,320,634	\$ 4,613,582
Pension Expense				
Proportionate share of plan pension expense.....	\$ 203,044	\$ 4,104,317	\$ 2,190,173	\$ 5,877,769
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	21,073	729,031	(122,402)	(627,170)
Total Employer Pension Expense.....	\$ 224,117	\$ 4,833,348	\$ 2,067,771	\$ 5,050,599
Contributions				
Statutory required contribution.....	\$ 251,979	\$ 3,209,995	\$ 1,787,745	\$ 4,786,602
Contribution in relation to statutory required contribution.....	(251,979)	(3,243,063)	(2,087,745)	(4,787,530)
Contribution deficiency/(excess).....	\$ -	\$ (33,068)	\$ (300,000)	\$ (928)
Contributions as a percentage of covered payroll.....	21.72%	21.43%	27.59%	23.42%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 86,876	\$ 605,652	\$ 294,371	\$ (132,021)
June 30, 2023.....	18,395	535,028	169,184	80,209
June 30, 2024.....	(47,619)	(240,701)	(235,821)	(917,073)
June 30, 2025.....	(14,136)	(368,699)	(176,874)	(554,711)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 43,516	\$ 531,280	\$ 50,860	\$ (1,523,596)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 2,212,330	\$ 44,719,784	\$ 23,863,640	\$ 64,042,933
Current discount rate (7.30%).....	\$ 1,775,392	\$ 35,887,576	\$ 19,150,544	\$ 51,394,381
1% increase (8.30%).....	\$ 1,407,788	\$ 28,456,869	\$ 15,185,325	\$ 40,752,910
Covered Payroll.....	\$ 1,180,138	\$ 15,134,292	\$ 7,568,121	\$ 20,438,300
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, 2020

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 157,213,941	\$ 12,546,753	\$ 137,604,549	\$ 11,101,958
Ending net pension liability/(asset).....	\$ 152,215,238	\$ 12,166,423	\$ 133,422,263	\$ 10,349,764
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,783,960	\$ 222,519	\$ 2,440,244	\$ 189,293
Changes of assumptions.....	5,810,620	464,437	5,093,223	395,089
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,491,321	564,014	3,490,509	296,813
Total Deferred Outflows of Resources.....	\$ 10,085,901	\$ 1,250,970	\$ 11,023,976	\$ 881,195
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 180,130	\$ 14,398	\$ 157,890	\$ 12,248
Net difference between projected and actual investment earnings on pension plan investments.....	8,628,859	689,697	7,563,513	586,713
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,955,419	-	668,051	317,499
Total Deferred Inflows of Resources.....	\$ 10,764,408	\$ 704,095	\$ 8,389,454	\$ 916,460
Pension Expense				
Proportionate share of plan pension expense.....	\$ 17,408,248	\$ 1,391,427	\$ 15,258,969	\$ 1,183,661
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(404,712)	402,845	954,544	46,834
Total Employer Pension Expense.....	\$ 17,003,536	\$ 1,794,272	\$ 16,213,513	\$ 1,230,495
Contributions				
Statutory required contribution.....	\$ 12,782,396	\$ 1,008,914	\$ 10,675,811	\$ 1,057,819
Contribution in relation to statutory required contribution.....	(12,782,396)	(1,008,914)	(10,675,811)	(1,057,819)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	33.10%	28.53%	28.91%	17.57%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 243,239	\$ 299,219	\$ 2,009,237	\$ 77,979
June 30, 2023.....	1,206,980	280,294	1,901,187	170,793
June 30, 2024.....	(876,257)	66,434	(109,844)	(159,511)
June 30, 2025.....	(1,252,469)	(99,072)	(1,166,258)	(124,526)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (678,507)	\$ 546,875	\$ 2,634,522	\$ (35,265)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 189,676,578	\$ 15,160,673	\$ 166,258,508	\$ 12,896,920
Current discount rate (7.30%).....	\$ 152,215,238	\$ 12,166,423	\$ 133,422,263	\$ 10,349,764
1% increase (8.30%).....	\$ 120,698,291	\$ 9,647,303	\$ 105,796,498	\$ 8,206,792
Covered Payroll.....	\$ 38,618,991	\$ 3,536,280	\$ 36,934,043	\$ 6,020,631
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, 2020

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 114,671,152	\$ 68,887,607	\$ 3,317,391	\$ 25,513,416
Ending net pension liability/(asset).....	\$ 110,931,084	\$ 66,580,110	\$ 3,218,104	\$ 24,595,262
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,028,888	\$ 1,217,726	\$ 58,858	\$ 449,838
Changes of assumptions.....	4,234,651	2,541,610	122,847	938,892
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,539,688	1,315,405	296,849	870,744
Total Deferred Outflows of Resources.....	\$ 7,803,227	\$ 5,074,741	\$ 478,554	\$ 2,259,474
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 131,274	\$ 78,790	\$ 3,808	\$ 29,106
Net difference between projected and actual investment earnings on pension plan investments.....	6,288,521	3,774,329	182,430	1,394,269
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,105,442	240,727	-	143,377
Total Deferred Inflows of Resources.....	\$ 7,525,237	\$ 4,093,846	\$ 186,238	\$ 1,566,752
Pension Expense				
Proportionate share of plan pension expense.....	\$ 12,686,743	\$ 7,614,498	\$ 368,041	\$ 2,812,861
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(51,174)	534,168	85,680	146,886
Total Employer Pension Expense.....	\$ 12,635,569	\$ 8,148,666	\$ 453,721	\$ 2,959,747
Contributions				
Statutory required contribution.....	\$ 9,511,562	\$ 5,727,650	\$ 292,296	\$ 2,090,290
Contribution in relation to statutory required contribution.....	(9,511,562)	(5,727,860)	(292,296)	(2,090,290)
Contribution deficiency/(excess).....	\$ -	\$ (210)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	32.68%	32.82%	19.42%	25.17%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 1,143,379	\$ 1,015,509	\$ 171,075	\$ 337,566
June 30, 2023.....	711,598	779,136	110,495	511,983
June 30, 2024.....	(685,261)	(270,827)	31,819	61,229
June 30, 2025.....	(891,726)	(543,123)	(20,873)	(218,056)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 277,990	\$ 980,895	\$ 292,316	\$ 692,722
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 138,232,077	\$ 82,965,987	\$ 4,010,104	\$ 30,648,345
Current discount rate (7.30%).....	\$ 110,931,084	\$ 66,580,110	\$ 3,218,104	\$ 24,595,262
1% increase (8.30%).....	\$ 87,962,233	\$ 52,794,356	\$ 2,551,779	\$ 19,502,687
Covered Payroll.....	\$ 29,108,756	\$ 17,454,816	\$ 1,504,932	\$ 8,305,473
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, 2020

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 26,676,612	\$ 26,084,382	\$ 69,381,303	\$ 27,767,333
Ending net pension liability/(asset).....	\$ 25,050,502	\$ 24,095,505	\$ 66,148,477	\$ 26,477,563
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 458,164	\$ 440,698	\$ 1,209,831	\$ 484,265
Changes of assumptions.....	956,271	919,815	2,525,133	1,010,747
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>446,142</u>	<u>1,136,656</u>	<u>199,174</u>	<u>150,639</u>
Total Deferred Outflows of Resources.....	\$ <u>1,860,577</u>	\$ <u>2,497,169</u>	\$ <u>3,934,138</u>	\$ <u>1,645,651</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 29,644	\$ 28,514	\$ 78,279	\$ 31,333
Net difference between projected and actual investment earnings on pension plan investments.....	1,420,076	1,365,939	3,749,860	1,500,974
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>928,337</u>	<u>489,170</u>	<u>1,008,453</u>	<u>506,474</u>
Total Deferred Inflows of Resources.....	\$ <u>2,378,057</u>	\$ <u>1,883,623</u>	\$ <u>4,836,592</u>	\$ <u>2,038,781</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,864,925	\$ 2,755,706	\$ 7,565,135	\$ 3,028,131
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(304,593)</u>	<u>399,656</u>	<u>(220,380)</u>	<u>(257,082)</u>
Total Employer Pension Expense.....	\$ <u>2,560,332</u>	\$ <u>3,155,362</u>	\$ <u>7,344,755</u>	\$ <u>2,771,049</u>
Contributions				
Statutory required contribution.....	\$ 2,385,594	\$ 2,486,832	\$ 6,204,177	\$ 2,434,008
Contribution in relation to statutory required contribution.....	<u>(2,385,594)</u>	<u>(2,486,832)</u>	<u>(6,207,788)</u>	<u>(2,434,721)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>(3,611)</u>	\$ <u>(713)</u>
Contributions as a percentage of covered payroll.....	20.11%	14.63%	27.47%	22.13%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 100,503	\$ 552,507	\$ 313,855	\$ 20,318
June 30, 2023.....	172,661	649,082	303,009	190,705
June 30, 2024.....	(490,664)	(258,504)	(907,292)	(349,949)
June 30, 2025.....	<u>(299,980)</u>	<u>(329,539)</u>	<u>(612,026)</u>	<u>(254,204)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>(517,480)</u>	\$ <u>613,546</u>	\$ <u>(902,454)</u>	\$ <u>(393,130)</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 31,215,623	\$ 30,025,594	\$ 82,428,126	\$ 32,993,895
Current discount rate (7.30%).....	\$ 25,050,502	\$ 24,095,505	\$ 66,148,477	\$ 26,477,563
1% increase (8.30%).....	\$ 19,863,667	\$ 19,106,407	\$ 52,452,095	\$ 20,995,247
Covered Payroll.....	\$ 11,880,989	\$ 17,002,761	\$ 22,598,280	\$ 11,002,408
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, 2020

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 26,056,611	\$ 52,178,434	\$ 18,312,861	\$ 10,450,215
Ending net pension liability/(asset).....	\$ 23,466,261	\$ 50,095,267	\$ 17,612,899	\$ 9,801,713
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 429,189	\$ 916,224	\$ 322,133	\$ 179,270
Changes of assumptions.....	895,794	1,912,322	672,350	374,168
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>1,320,076</u>	<u>70,700</u>	<u>25,960</u>	<u>100,762</u>
Total Deferred Outflows of Resources.....	\$ <u>2,645,059</u>	\$ <u>2,899,246</u>	\$ <u>1,020,443</u>	\$ <u>654,200</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 27,770	\$ 59,282	\$ 20,843	\$ 11,599
Net difference between projected and actual investment earnings on pension plan investments.....	1,330,268	2,839,827	998,449	555,645
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>310,142</u>	<u>1,049,586</u>	<u>141,622</u>	<u>755,393</u>
Total Deferred Inflows of Resources.....	\$ <u>1,668,180</u>	\$ <u>3,948,694</u>	\$ <u>1,160,914</u>	\$ <u>1,322,637</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,683,744	\$ 5,729,196	\$ 2,014,317	\$ 1,120,983
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>638,992</u>	<u>(534,216)</u>	<u>332,236</u>	<u>(303,272)</u>
Total Employer Pension Expense.....	\$ <u>3,322,736</u>	\$ <u>5,194,980</u>	\$ <u>2,346,553</u>	\$ <u>817,711</u>
Contributions				
Statutory required contribution.....	\$ 2,355,174	\$ 4,401,955	\$ 1,530,300	\$ 1,087,478
Contribution in relation to statutory required contribution.....	<u>(3,281,774)</u>	<u>(4,401,955)</u>	<u>(1,531,884)</u>	<u>(1,087,478)</u>
Contribution deficiency/(excess).....	\$ <u>(926,600)</u>	\$ <u>-</u>	\$ <u>(1,584)</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	23.93%	30.68%	30.25%	23.79%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 585,195	\$ 36,029	\$ 55,025	\$ (150,323)
June 30, 2023.....	712,148	69,268	131,498	(105,486)
June 30, 2024.....	(49,317)	(699,864)	(189,904)	(323,772)
June 30, 2025.....	<u>(271,147)</u>	<u>(455,081)</u>	<u>(157,090)</u>	<u>(88,856)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>976,879</u>	\$ <u>(1,049,448)</u>	\$ <u>(140,471)</u>	\$ <u>(668,437)</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 29,241,488	\$ 62,424,097	\$ 21,947,569	\$ 12,213,990
Current discount rate (7.30%).....	\$ 23,466,261	\$ 50,095,267	\$ 17,612,899	\$ 9,801,713
1% increase (8.30%).....	\$ 18,607,451	\$ 39,722,784	\$ 13,966,058	\$ 7,772,218
Covered Payroll.....	\$ 13,713,395	\$ 14,347,517	\$ 5,064,259	\$ 4,571,874
See notes to schedule of employer allocations and schedule of pension amounts by employer.				(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2020

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 9,325,501	\$ 11,909,143	\$ 64,186,721	\$ 107,519,124
Ending net pension liability/(asset).....	\$ 8,952,975	\$ 11,389,407	\$ 61,745,935	\$ 104,198,258
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 163,747	\$ 208,308	\$ 1,129,310	\$ 1,905,747
Changes of assumptions.....	341,768	434,776	2,357,071	3,977,634
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	38,702	44,864	415,995	1,352,170
Total Deferred Outflows of Resources.....	\$ 544,217	\$ 687,948	\$ 3,902,376	\$ 7,235,551
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 10,595	\$ 13,478	\$ 73,069	\$ 123,307
Net difference between projected and actual investment earnings on pension plan investments.....	507,531	645,649	3,500,287	5,906,847
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	81,437	42,971	1,239,986	1,130,973
Total Deferred Inflows of Resources.....	\$ 599,563	\$ 702,098	\$ 4,813,342	\$ 7,161,127
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,023,915	\$ 1,302,561	\$ 7,061,635	\$ 11,916,738
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(246,747)	51,934	(313,354)	257,644
Total Employer Pension Expense.....	\$ 777,168	\$ 1,354,495	\$ 6,748,281	\$ 12,174,382
Contributions				
Statutory required contribution.....	\$ 818,964	\$ 1,024,938	\$ 5,389,846	\$ 8,797,968
Contribution in relation to statutory required contribution.....	(618,964)	(1,024,938)	(5,389,846)	(8,807,233)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (9,265)
Contributions as a percentage of covered payroll.....	39.15%	27.78%	28.94%	36.29%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ (1,447)	\$ 86,640	\$ 319,715	\$ 1,098,016
June 30, 2023.....	88,483	114,535	98,035	534,620
June 30, 2024.....	(67,459)	(108,063)	(784,345)	(731,143)
June 30, 2025.....	(74,923)	(107,262)	(544,371)	(827,069)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (55,346)	\$ (14,150)	\$ (910,966)	\$ 74,424
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 11,156,371	\$ 14,192,428	\$ 76,942,084	\$ 129,842,250
Current discount rate (7.30%).....	\$ 8,952,975	\$ 11,389,407	\$ 61,745,935	\$ 104,198,258
1% increase (8.30%).....	\$ 7,099,216	\$ 9,031,172	\$ 48,961,122	\$ 82,623,473
Covered Payroll.....	\$ 2,091,842	\$ 3,689,219	\$ 18,621,425	\$ 24,269,942
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, 2020

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 8,637,189	\$ 25,022,982	\$ 59,191,196	\$ 59,489,841
Ending net pension liability/(asset).....	\$ 8,103,799	\$ 24,002,922	\$ 56,416,777	\$ 56,098,309
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 148,215	\$ 439,005	\$ 1,031,842	\$ 1,026,017
Changes of assumptions.....	309,352	916,281	2,153,638	2,141,481
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	182,913	802,436	117,079	1,001,946
Total Deferred Outflows of Resources.....	\$ 640,460	\$ 2,157,722	\$ 3,302,559	\$ 4,169,444
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 9,590	\$ 28,405	\$ 66,763	\$ 66,386
Net difference between projected and actual investment earnings on pension plan investments.....	459,393	1,360,691	3,198,185	3,180,131
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	530,294	311,089	1,224,644	999,143
Total Deferred Inflows of Resources.....	\$ 999,277	\$ 1,700,185	\$ 4,489,592	\$ 4,245,660
Pension Expense				
Proportionate share of plan pension expense.....	\$ 926,800	\$ 2,745,120	\$ 6,452,162	\$ 6,415,738
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(41,155)	462,648	(1,054,459)	300,562
Total Employer Pension Expense.....	\$ 885,645	\$ 3,207,768	\$ 5,397,703	\$ 6,716,300
Contributions				
Statutory required contribution.....	\$ 911,165	\$ 2,152,711	\$ 5,182,237	\$ 5,473,719
Contribution in relation to statutory required contribution.....	(911,165)	(2,152,711)	(5,182,543)	(5,473,719)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (306)	\$ -
Contributions as a percentage of covered payroll.....	24.49%	23.68%	24.81%	20.26%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ (144,474)	\$ 165,232	\$ (135,015)	\$ 524,941
June 30, 2023.....	40,309	506,614	272,812	742,237
June 30, 2024.....	(184,101)	(866)	(777,235)	(744,645)
June 30, 2025.....	(70,531)	(213,443)	(547,595)	(598,749)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (358,797)	\$ 457,537	\$ (1,187,033)	\$ (76,216)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 10,098,206	\$ 29,910,226	\$ 70,301,380	\$ 69,904,534
Current discount rate (7.30%).....	\$ 8,103,799	\$ 24,002,922	\$ 56,416,777	\$ 56,098,309
1% increase (8.30%).....	\$ 6,425,866	\$ 19,032,994	\$ 44,735,393	\$ 44,482,866
Covered Payroll.....	\$ 3,721,241	\$ 9,090,782	\$ 20,891,951	\$ 27,016,988
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, 2020

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 67,631,236	\$ 91,654,915	\$ 31,360,065	\$ 3,732,674
Ending net pension liability/(asset).....	\$ 64,849,395	\$ 86,423,315	\$ 30,083,545	\$ 3,548,184
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,186,071	\$ 1,580,650	\$ 550,217	\$ 64,895
Changes of assumptions.....	2,475,542	3,299,099	1,148,401	135,447
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	337,745	629,969	-
Total Deferred Outflows of Resources.....	\$ 3,661,613	\$ 5,217,494	\$ 2,328,587	\$ 200,342
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 76,742	\$ 102,272	\$ 35,601	\$ 4,199
Net difference between projected and actual investment earnings on pension plan investments.....	3,676,217	4,899,211	1,705,392	201,141
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,287,778	512,919	46,454	180,239
Total Deferred Inflows of Resources.....	\$ 5,040,737	\$ 5,514,402	\$ 1,787,447	\$ 385,579
Pension Expense				
Proportionate share of plan pension expense.....	\$ 7,416,567	\$ 9,883,887	\$ 3,440,535	\$ 405,791
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(965,118)	116,078	456,183	(30,213)
Total Employer Pension Expense.....	\$ 6,451,449	\$ 9,999,965	\$ 3,896,718	\$ 375,578
Contributions				
Statutory required contribution.....	\$ 5,688,652	\$ 7,593,868	\$ 2,794,347	\$ 256,971
Contribution in relation to statutory required contribution.....	(5,688,652)	(9,104,998)	(2,794,347)	(256,971)
Contribution deficiency/(excess).....	\$ -	\$ (1,511,130)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	26.44%	37.07%	18.07%	20.14%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ (247,438)	\$ 706,420	\$ 404,562	\$ (33,702)
June 30, 2023.....	256,687	531,592	488,982	(23,442)
June 30, 2024.....	(777,384)	(745,723)	(104,513)	(77,989)
June 30, 2025.....	(610,989)	(789,197)	(247,891)	(50,104)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (1,379,124)	\$ (296,908)	\$ 541,140	\$ (185,237)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 80,809,330	\$ 107,692,757	\$ 37,487,337	\$ 4,421,419
Current discount rate (7.30%).....	\$ 64,849,395	\$ 86,423,315	\$ 30,083,545	\$ 3,548,184
1% increase (8.30%).....	\$ 51,421,994	\$ 68,528,923	\$ 23,854,592	\$ 2,813,514
Covered Payroll.....	\$ 21,442,179	\$ 24,560,364	\$ 15,468,104	\$ 1,275,867
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, 2020

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 332,568	\$ 1,647,762	\$ 2,275,176	\$ 343,766
Ending net pension liability/(asset).....	\$ 315,580	\$ 1,612,020	\$ 2,016,950	\$ 24,164
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 5,772	\$ 29,483	\$ 36,889	\$ 442
Changes of assumptions.....	12,047	61,537	76,994	922
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,770	77,417	223,910	275,404
Total Deferred Outflows of Resources.....	\$ 19,589	\$ 168,437	\$ 337,793	\$ 276,768
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 373	\$ 1,908	\$ 2,387	\$ 29
Net difference between projected and actual investment earnings on pension plan investments.....	17,890	91,383	114,338	1,370
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	8,952	19,343	90,196	389,104
Total Deferred Inflows of Resources.....	\$ 27,215	\$ 112,634	\$ 206,921	\$ 390,503
Pension Expense				
Proportionate share of plan pension expense.....	\$ 36,091	\$ 184,361	\$ 230,670	\$ 2,765
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	3,306	42,968	156,340	64,781
Total Employer Pension Expense.....	\$ 39,397	\$ 227,329	\$ 387,010	\$ 67,546
Contributions				
Statutory required contribution.....	\$ 27,468	\$ 115,453	\$ 241,136	\$ 67,843
Contribution in relation to statutory required contribution.....	(27,468)	(115,453)	(271,136)	(67,843)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (30,000)	\$ -
Contributions as a percentage of covered payroll.....	15.64%	27.89%	9.93%	4.64%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 958	\$ 28,563	\$ 179,710	\$ 7,526
June 30, 2023.....	541	29,965	26,388	31,760
June 30, 2024.....	(5,483)	11,307	(43,080)	(106,367)
June 30, 2025.....	(3,642)	(14,032)	(32,146)	(46,654)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (7,626)	\$ 55,803	\$ 130,872	\$ (113,735)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 393,247	\$ 2,008,751	\$ 2,513,337	\$ 30,111
Current discount rate (7.30%).....	\$ 315,580	\$ 1,612,020	\$ 2,016,950	\$ 24,164
1% increase (8.30%).....	\$ 250,238	\$ 1,278,243	\$ 1,599,330	\$ 19,161
Covered Payroll.....	\$ 175,575	\$ 413,931	\$ 2,729,849	\$ 1,463,629
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, 2020

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 2,317,408	\$ 3,356,809	\$ 395,631	\$ 712,131
Ending net pension liability/(asset).....	\$ 2,264,513	\$ 3,240,627	\$ 366,619	\$ 649,547
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 41,417	\$ 59,270	\$ 6,705	\$ 11,880
Changes of assumptions.....	86,445	123,707	13,995	24,796
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	44,940	68,943	14,729	44,301
Total Deferred Outflows of Resources.....	\$ 172,802	\$ 251,920	\$ 35,429	\$ 80,977
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 2,680	\$ 3,835	\$ 434	\$ 769
Net difference between projected and actual investment earnings on pension plan investments.....	128,372	183,706	20,783	36,822
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	43,511	94,000	7,321	44,010
Total Deferred Inflows of Resources.....	\$ 174,563	\$ 281,541	\$ 28,538	\$ 81,601
Pension Expense				
Proportionate share of plan pension expense.....	\$ 258,985	\$ 370,617	\$ 41,929	\$ 74,286
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(10,205)	4,119	6,314	5,358
Total Employer Pension Expense.....	\$ 248,780	\$ 374,736	\$ 48,243	\$ 79,644
Contributions				
Statutory required contribution.....	\$ 162,257	\$ 247,338	\$ 35,999	\$ 51,505
Contribution in relation to statutory required contribution.....	(162,257)	(247,338)	(35,999)	(51,505)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	38.00%	33.60%	16.21%	13.61%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 22,176	\$ 55,721	\$ 7,568	\$ 4,150
June 30, 2023.....	7,153	(9,130)	8,380	18,447
June 30, 2024.....	(10,890)	(42,763)	(3,909)	(9,554)
June 30, 2025.....	(20,200)	(33,449)	(5,148)	(13,667)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (1,761)	\$ (29,621)	\$ 6,891	\$ (624)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 2,821,827	\$ 4,038,170	\$ 456,847	\$ 809,406
Current discount rate (7.30%).....	\$ 2,264,513	\$ 3,240,627	\$ 366,619	\$ 649,547
1% increase (8.30%).....	\$ 1,795,634	\$ 2,569,639	\$ 290,709	\$ 515,055
Covered Payroll.....	\$ 426,964	\$ 736,128	\$ 222,136	\$ 378,327
See notes to schedule of employer allocations and schedule of pension amounts by employer.				

(continued)

SCHEDULE OF PENSION AMOUNTS BY EMPLOYER

FOR THE YEAR ENDED DECEMBER 31, 2020

	Greater Lowell Regional Vocation Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 18,372,432	\$ 13,046,678	\$ 704,593	\$ 9,126,061
Ending net pension liability/(asset).....	\$ 17,820,793	\$ 12,381,614	\$ 616,643	\$ 8,715,281
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 325,936	\$ 226,455	\$ 11,278	\$ 159,399
Changes of assumptions.....	680,286	472,652	23,540	332,695
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	531,315	427,683	-	34,883
Total Deferred Outflows of Resources.....	\$ 1,537,537	\$ 1,126,790	\$ 34,818	\$ 526,977
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 21,089	\$ 14,652	\$ 730	\$ 10,314
Net difference between projected and actual investment earnings on pension plan investments.....	1,010,235	701,896	34,957	494,057
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	189,529	110,392	337,713	288,509
Total Deferred Inflows of Resources.....	\$ 1,220,853	\$ 826,940	\$ 373,400	\$ 792,880
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,038,095	\$ 1,416,037	\$ 70,523	\$ 996,734
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(48,921)	351,249	(166,362)	(162,808)
Total Employer Pension Expense.....	\$ 1,989,174	\$ 1,767,286	\$ (95,839)	\$ 833,926
Contributions				
Statutory required contribution.....	\$ 1,307,090	\$ 1,077,851	\$ 98,078	\$ 755,859
Contribution in relation to statutory required contribution.....	(1,307,090)	(1,077,851)	(98,078)	(755,859)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	29.23%	26.52%	26.42%	25.23%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 297,608	\$ 277,350	\$ (141,223)	\$ 31
June 30, 2023.....	220,599	233,028	(91,667)	(23,854)
June 30, 2024.....	(23,285)	(67,935)	(97,217)	(151,870)
June 30, 2025.....	(178,238)	(142,593)	(8,475)	(90,210)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 316,684	\$ 299,850	\$ (338,582)	\$ (265,903)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 22,206,627	\$ 15,428,824	\$ 768,404	\$ 10,860,179
Current discount rate (7.30%).....	\$ 17,820,793	\$ 12,381,614	\$ 616,643	\$ 8,715,281
1% increase (8.30%).....	\$ 14,130,906	\$ 9,817,937	\$ 488,964	\$ 6,910,737
Covered Payroll.....	\$ 4,471,774	\$ 4,064,118	\$ 371,288	\$ 2,995,522
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, 2020

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 3,735,397	\$ 1,074,652	\$ 13,400,780	\$ 8,870,284
Ending net pension liability/(asset).....	\$ 3,650,910	\$ 977,691	\$ 12,806,518	\$ 8,542,800
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 66,774	\$ 17,882	\$ 234,226	\$ 156,245
Changes of assumptions.....	139,369	37,322	488,872	326,110
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>99,809</u>	<u>51,684</u>	<u>99,538</u>	<u>17,943</u>
Total Deferred Outflows of Resources.....	\$ <u>305,952</u>	\$ <u>106,888</u>	\$ <u>822,636</u>	\$ <u>500,298</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 4,320	\$ 1,157	\$ 15,155	\$ 10,109
Net difference between projected and actual investment earnings on pension plan investments.....	206,965	55,424	725,983	484,279
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>80,848</u>	<u>64,687</u>	<u>76,037</u>	<u>161,430</u>
Total Deferred Inflows of Resources.....	\$ <u>292,133</u>	\$ <u>121,268</u>	\$ <u>817,175</u>	\$ <u>655,818</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 417,539	\$ 111,814	\$ 1,464,631	\$ 977,006
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(21,989)</u>	<u>(6,457)</u>	<u>(56,911)</u>	<u>(75,606)</u>
Total Employer Pension Expense.....	\$ <u>395,550</u>	\$ <u>105,357</u>	\$ <u>1,407,720</u>	\$ <u>901,400</u>
Contributions				
Statutory required contribution.....	\$ 324,010	\$ 72,338	\$ 1,123,918	\$ 706,293
Contribution in relation to statutory required contribution.....	<u>(324,010)</u>	<u>(72,338)</u>	<u>(1,123,918)</u>	<u>(706,293)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	32.62%	10.81%	20.39%	25.77%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 42,313	\$ 23,136	\$ 90,969	\$ (57,529)
June 30, 2023.....	7,591	10,299	146,283	53,326
June 30, 2024.....	(16,150)	(25,690)	(103,629)	(70,028)
June 30, 2025.....	<u>(19,935)</u>	<u>(22,125)</u>	<u>(128,162)</u>	<u>(81,289)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>13,819</u>	\$ <u>(14,380)</u>	\$ <u>5,461</u>	\$ <u>(155,520)</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 4,549,427	\$ 1,218,308	\$ 15,958,301	\$ 10,645,249
Current discount rate (7.30%).....	\$ 3,650,910	\$ 977,691	\$ 12,806,518	\$ 8,542,800
1% increase (8.30%).....	\$ 2,894,970	\$ 775,255	\$ 10,154,863	\$ 6,773,969
Covered Payroll.....	\$ 993,404	\$ 669,355	\$ 5,512,936	\$ 2,741,245
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, 2020

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 7,027,195	\$ 2,571,703	\$ 1,723,517	\$ 675,758
Ending net pension liability/(asset).....	\$ 6,677,782	\$ 2,449,672	\$ 1,645,758	\$ 625,875
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 122,134	\$ 44,804	\$ 30,100	\$ 11,447
Changes of assumptions.....	254,916	93,513	62,825	23,892
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>14,425</u>	<u>254,281</u>	<u>18,966</u>	<u>12,210</u>
Total Deferred Outflows of Resources.....	\$ <u>391,475</u>	\$ <u>392,598</u>	\$ <u>111,591</u>	\$ <u>47,549</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 7,902	\$ 2,899	\$ 1,948	\$ 741
Net difference between projected and actual investment earnings on pension plan investments.....	378,554	138,868	93,296	35,480
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>341,979</u>	<u>130,042</u>	<u>20,416</u>	<u>53,346</u>
Total Deferred Inflows of Resources.....	\$ <u>728,435</u>	\$ <u>271,809</u>	\$ <u>115,660</u>	\$ <u>89,567</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 763,711	\$ 280,158	\$ 188,221	\$ 71,580
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(174,756)</u>	<u>74,527</u>	<u>22,571</u>	<u>6,616</u>
Total Employer Pension Expense.....	\$ <u>588,955</u>	\$ <u>354,685</u>	\$ <u>210,792</u>	\$ <u>78,196</u>
Contributions				
Statutory required contribution.....	\$ 599,951	\$ 142,163	\$ 137,197	\$ 55,104
Contribution in relation to statutory required contribution.....	<u>(599,951)</u>	<u>(142,163)</u>	<u>(137,197)</u>	<u>(55,104)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	26.52%	13.24%	32.61%	17.34%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ (145,736)	\$ 34,097	\$ 14,933	\$ (6,315)
June 30, 2023.....	2,396	95,662	11,837	(4,236)
June 30, 2024.....	(122,177)	31,673	(12,662)	(21,341)
June 30, 2025.....	<u>(71,443)</u>	<u>(40,643)</u>	<u>(18,177)</u>	<u>(10,126)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>(336,960)</u>	\$ <u>120,789</u>	\$ <u>(4,069)</u>	\$ <u>(42,018)</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 8,321,235	\$ 3,052,555	\$ 2,050,792	\$ 779,908
Current discount rate (7.30%).....	\$ 6,677,782	\$ 2,449,672	\$ 1,645,758	\$ 625,875
1% increase (8.30%).....	\$ 5,295,113	\$ 1,942,455	\$ 1,304,995	\$ 496,284
Covered Payroll.....	\$ 2,262,465	\$ 1,073,885	\$ 420,708	\$ 317,752
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, 2020

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 537,329	\$ 490,188	\$ 382,144	\$ 907,630
Ending net pension liability/(asset).....	\$ 517,677	\$ 465,613	\$ 370,673	\$ 861,176
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 9,468	\$ 8,516	\$ 6,779	\$ 15,751
Changes of assumptions.....	19,762	17,774	14,150	32,874
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,801	10,840	12,102	27,910
Total Deferred Outflows of Resources.....	\$ 34,031	\$ 37,130	\$ 33,031	\$ 76,535
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 613	\$ 551	\$ 439	\$ 1,019
Net difference between projected and actual investment earnings on pension plan investments.....	29,346	26,395	21,013	48,819
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	13,069	6,428	466	57,546
Total Deferred Inflows of Resources.....	\$ 43,028	\$ 33,374	\$ 21,918	\$ 107,384
Pension Expense				
Proportionate share of plan pension expense.....	\$ 59,204	\$ 53,250	\$ 42,392	\$ 98,489
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(5,789)	21,075	9,404	(22,108)
Total Employer Pension Expense.....	\$ 53,415	\$ 74,325	\$ 51,796	\$ 76,381
Contributions				
Statutory required contribution.....	\$ 40,023	\$ 43,152	\$ 32,574	\$ 66,700
Contribution in relation to statutory required contribution.....	(40,023)	(43,152)	(32,574)	(66,700)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	49.59%	40.38%	22.35%	15.98%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ (5,181)	\$ 12,274	\$ 8,460	\$ (28,564)
June 30, 2023.....	5,989	2,020	5,782	15,635
June 30, 2024.....	(4,359)	(5,781)	(499)	(6,313)
June 30, 2025.....	(5,446)	(4,757)	(2,630)	(11,607)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (8,997)	\$ 3,756	\$ 11,113	\$ (30,849)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 645,081	\$ 580,204	\$ 461,898	\$ 1,073,118
Current discount rate (7.30%).....	\$ 517,677	\$ 465,613	\$ 370,673	\$ 861,176
1% increase (8.30%).....	\$ 410,489	\$ 369,205	\$ 293,923	\$ 682,865
Covered Payroll.....	\$ 80,704	\$ 106,861	\$ 145,743	\$ 417,322
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, 2020

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 345,712	\$ 879,177	\$ 175,571	\$ 621,840
Ending net pension liability/(asset).....	\$ 327,467	\$ 858,485	\$ 168,599	\$ 607,838
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 5,989	\$ 15,701	\$ 3,084	\$ 11,117
Changes of assumptions.....	12,501	32,772	6,436	23,203
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	121,361	23,323	11,777	60,563
Total Deferred Outflows of Resources.....	\$ 139,851	\$ 71,796	\$ 21,297	\$ 94,903
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 388	\$ 1,016	\$ 200	\$ 719
Net difference between projected and actual investment earnings on pension plan investments.....	18,564	48,666	9,558	34,457
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	14,732	216,044	13,692	7,047
Total Deferred Inflows of Resources.....	\$ 33,684	\$ 265,726	\$ 23,450	\$ 42,223
Pension Expense				
Proportionate share of plan pension expense.....	\$ 37,451	\$ 98,181	\$ 19,282	\$ 69,517
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	30,738	25,658	(10,022)	26,128
Total Employer Pension Expense.....	\$ 68,189	\$ 123,839	\$ 9,260	\$ 95,645
Contributions				
Statutory required contribution.....	\$ 14,349	\$ 62,116	\$ 15,782	\$ 43,356
Contribution in relation to statutory required contribution.....	(14,349)	(62,116)	(15,782)	(43,356)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	6.61%	51.07%	18.71%	105.50%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 44,268	\$ (192,327)	\$ (7,948)	\$ 22,464
June 30, 2023.....	43,838	5,828	5,958	21,400
June 30, 2024.....	24,785	226	1,168	14,241
June 30, 2025.....	(6,724)	(7,657)	(1,331)	(5,425)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 106,167	\$ (193,930)	\$ (2,153)	\$ 52,680
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 408,059	\$ 1,069,765	\$ 210,093	\$ 757,432
Current discount rate (7.30%).....	\$ 327,467	\$ 858,485	\$ 168,599	\$ 607,838
1% increase (8.30%).....	\$ 259,663	\$ 680,731	\$ 133,890	\$ 481,982
Covered Payroll.....	\$ 217,060	\$ 121,622	\$ 84,340	\$ 41,096
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, 2020

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 570,710	\$ 484,781	\$ 528,855	\$ 251,415
Ending net pension liability/(asset).....	\$ 537,128	\$ 453,772	\$ 516,453	\$ 247,338
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 9,824	\$ 8,299	\$ 9,446	\$ 4,524
Changes of assumptions.....	20,504	17,322	19,715	9,442
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	7,328	34,386	13,309	34,014
Total Deferred Outflows of Resources.....	\$ 37,656	\$ 60,007	\$ 42,470	\$ 47,980
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 636	\$ 537	\$ 611	\$ 293
Net difference between projected and actual investment earnings on pension plan investments.....	30,449	25,724	29,277	14,021
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	8,626	26,984	13,439	1,837
Total Deferred Inflows of Resources.....	\$ 39,711	\$ 53,245	\$ 43,327	\$ 16,151
Pension Expense				
Proportionate share of plan pension expense.....	\$ 61,429	\$ 51,897	\$ 59,063	\$ 28,288
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	6,509	(5,788)	5,519	19,979
Total Employer Pension Expense.....	\$ 67,938	\$ 46,109	\$ 64,582	\$ 48,267
Contributions				
Statutory required contribution.....	\$ 50,725	\$ 24,607	\$ 44,565	\$ 18,331
Contribution in relation to statutory required contribution.....	(50,725)	(24,607)	(44,565)	(18,331)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	21.57%	10.91%	24.72%	16.95%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 8,727	\$ 5,085	\$ 6,740	\$ 13,889
June 30, 2023.....	2,076	11,713	639	11,567
June 30, 2024.....	(6,580)	(590)	(5,078)	8,139
June 30, 2025.....	(6,278)	(9,446)	(3,158)	(1,766)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (2,055)	\$ 6,762	\$ (857)	\$ 31,829
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 669,319	\$ 565,449	\$ 643,556	\$ 308,210
Current discount rate (7.30%).....	\$ 537,128	\$ 453,772	\$ 516,453	\$ 247,338
1% increase (8.30%).....	\$ 425,913	\$ 359,816	\$ 409,519	\$ 196,125
Covered Payroll.....	\$ 235,134	\$ 225,565	\$ 180,246	\$ 108,132
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, 2020

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ 481,728	\$ 214,226	\$ 36,784
Ending net pension liability/(asset).....	\$ -	\$ 440,581	\$ 212,881	\$ 18,060
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 8,058	\$ 3,894	\$ 330
Changes of assumptions.....	\$ -	\$ 16,819	\$ 8,126	\$ 689
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 13,074	\$ 17,211	\$ 34,757	\$ 5,727
Total Deferred Outflows of Resources.....	\$ 13,074	\$ 42,088	\$ 46,777	\$ 6,746
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 521	\$ 252	\$ 21
Net difference between projected and actual investment earnings on pension plan investments.....	\$ -	\$ 24,976	\$ 12,068	\$ 1,024
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 4,284	\$ 19,950	\$ 496	\$ 14,465
Total Deferred Inflows of Resources.....	\$ 4,284	\$ 45,447	\$ 12,816	\$ 15,510
Pension Expense				
Proportionate share of plan pension expense.....	\$ -	\$ 50,386	\$ 24,346	\$ 2,067
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 867	\$ (839)	\$ 20,657	\$ (1,678)
Total Employer Pension Expense.....	\$ 867	\$ 49,547	\$ 45,003	\$ 389
Contributions				
Statutory required contribution.....	\$ 2,867	\$ 40,250	\$ 17,708	\$ 2,737
Contribution in relation to statutory required contribution.....	\$ (2,867)	\$ (40,250)	\$ (17,708)	\$ (2,737)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	0.00%	19.07%	18.72%	2.11%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2022.....	\$ 546	\$ 3,195	\$ 12,873	\$ (63)
June 30, 2023.....	\$ 4,832	\$ 8,210	\$ 13,639	\$ (1,469)
June 30, 2024.....	\$ 2,839	\$ (6,800)	\$ 8,178	\$ (3,936)
June 30, 2025.....	\$ 573	\$ (7,984)	\$ (729)	\$ (3,296)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 8,790	\$ (3,359)	\$ 33,961	\$ (6,764)
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ -	\$ 549,011	\$ 265,273	\$ 22,505
Current discount rate (7.30%).....	\$ -	\$ 440,581	\$ 212,881	\$ 18,060
1% increase (8.30%).....	\$ -	\$ 349,356	\$ 168,803	\$ 14,321
Covered Payroll.....	\$ -	\$ 211,109	\$ 94,616	\$ 129,814
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, 2020

	Ayer-Shirley Regional School District	Northern Middlesex Regional Emergency Communications Center	Totals
Net Pension Liability			
Beginning net pension liability/(asset).....	\$ 4,713,693	\$ -	\$ 1,600,056,015
Ending net pension liability/(asset).....	\$ 4,239,976	\$ (14,725)	\$ 1,531,093,126
Deferred Outflows of Resources			
Differences between expected and actual experience.....	\$ 77,548	\$ (266)	\$ 28,003,125
Changes of assumptions.....	161,856	(565)	58,447,504
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	211,719	-	22,923,004
Total Deferred Outflows of Resources.....	\$ 451,123	\$ (831)	\$ 109,373,633
Deferred Inflows of Resources			
Differences between expected and actual experience.....	\$ 5,018	\$ (20)	\$ 1,811,877
Net difference between projected and actual investment earnings on pension plan investments.....	240,358	(836)	86,795,430
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	442,391	10,452	22,923,004
Total Deferred Inflows of Resources.....	\$ 687,767	\$ 9,596	\$ 111,530,311
Pension Expense			
Proportionate share of plan pension expense.....	\$ 484,910	\$ (1,689)	\$ 175,461,325
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(171,523)	(2,609)	-
Total Employer Pension Expense.....	\$ 313,387	\$ (4,298)	\$ 175,461,325
Contributions			
Statutory required contribution.....	\$ 498,116	\$ -	\$ 135,472,822
Contribution in relation to statutory required contribution.....	(498,116)	-	(138,290,237)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (2,817,415)
Contributions as a percentage of covered payroll.....	13.58%	0.00%	26.95%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense			
June 30, 2022.....	\$ (48,034)	\$ (2,726)	\$ 11,702,352
June 30, 2023.....	30,394	(2,744)	13,634,748
June 30, 2024.....	(149,980)	(2,485)	(13,273,716)
June 30, 2025.....	(69,024)	(2,472)	(14,220,062)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ (236,644)	\$ (10,427)	\$ (2,156,678)
Discount Rate Sensitivity			
1% decrease (6.30%).....	\$ 5,283,467	\$ (18,351)	\$ 1,907,906,916
Current discount rate (7.30%).....	\$ 4,239,976	\$ (14,725)	\$ 1,531,093,126
1% increase (8.30%).....	\$ 3,362,067	\$ (11,675)	\$ 1,214,072,425
Covered Payroll.....	\$ 3,668,688	\$ -	\$ 513,201,283
See notes to schedule of employer allocations and schedule of pension amounts by employer.			(Concluded)

NOTE A – 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 MCRS has elected to use an actuarial based allocation methodology. Accordingly, each member unit's proportionate share of the total pension liability has been calculated based on each member unit's actual current employees, retirees and inactive participants. Each member's share of the MCRS'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 on 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 Middlesex Hospital be transferred to the Commonwealth. The legislation required that County and Hospital retirees and beneficiaries remain with the County Retirement System. The Commonwealth provided a mechanism, in the legislation, that fully funded the actuarially determined liability of those retirees. At December 31, 2018, the remaining liabilities for Middlesex County and the Middlesex Hospital retirees and beneficiaries were actuarially determined and are separately identified in the MCRS'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 MCRS have been identified and their total pension liability has been actuarially determined. For transparency purposes, the MCRS 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 MCRS's funding schedule. The 2003 ERIP amortization is straight line ending in fiscal 2020. The 2010 ERIP amortization is straight line ending in fiscal 2022.

NOTE B – 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.

The following assumption changes were reflected in the January 1, 2020 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.50% to 7.30%.

Changes in Plan Provisions

- As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$16,000 as of July 1, 2019.

MIDDLESEX COUNTY RETIREMENT SYSTEM

FINANCIAL STATEMENTS

YEAR ENDED DECEMBER 31, 2019

MIDDLESEX COUNTY RETIREMENT SYSTEM
FINANCIAL STATEMENTS
YEAR ENDED DECEMBER 31, 2019

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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, 2019, 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, 2019, 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 20, 2020, 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 20, 2020

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, 2019. 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 \$1.6 billion (net position).
- The System's net position increased by \$215.5 million for the year ended December 31, 2019.
- Total investment income was \$215.6 million; investment expenses were \$7.3 million; and net investment income was \$208.3 million.
- Total contributions were \$189 million, primarily consisting of \$129.7 million from employers, \$48.4 from members, \$6.1 million in transfers from other systems and \$4.8 million in other contributions.
- Retirement benefits, refunds, and transfers of member deductions to other systems amounted to \$178.5 million.
- Depreciation, administrative and building expenses were \$3.3 million.
- The total pension liability is \$3.2 billion as of December 31, 2019, while the net pension liability is \$1.6 billion.
- The Plan fiduciary net position as a percentage of the total pension liability is 49.45%.

Overview of the Financial Statements

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

Fiduciary Financial Statements

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

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

Notes to the financial statements

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

Required Supplementary Information

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

Financial Analysis

As noted earlier, net position may serve over time as a useful indicator of the System's financial position. The System's assets exceeded liabilities by \$1.6 billion at the close of 2019.

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 \$1.5 billion, cash of \$40.1 million and current accounts receivable of \$8.1 million. The system also had capital assets, net of accumulated depreciation of \$4.7 million at year-end primarily consisting of land, an office building, and building improvements.

In 2019, the System's contributions were \$189 million while deductions were \$181.8 million which resulted in a current surplus of \$7.2 million. In 2018, the System's contributions were \$176.2 million while deductions were \$173.4 million which resulted in a prior year surplus of \$2.8 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 \$208.3 million in 2019, and net investment loss was \$31.1 million in 2018. The annual money weighted rate of return was 16.21% and -2.52% in 2019, and 2018, respectively. The system's investment policy is designed to achieve a long-term rate of return of 7.30% and fluctuation in annual investment returns is expected.

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

	2019	2018
Assets:		
Cash.....	\$ 40,093,110	\$ 39,515,665
Investments.....	1,512,849,318	1,298,037,245
Receivables.....	8,110,976	7,678,260
Capital assets, net of accumulated depreciation....	4,722,962	5,041,775
Total assets.....	1,565,776,366	1,350,272,945
Liabilities:		
Accounts payable.....	142,242	141,480
Other.....	105,862	91,700
Total liabilities.....	248,104	233,180
Net Position Restricted for Pensions.....	\$ 1,565,528,262	\$ 1,350,039,765

	2019	2018
Additions:		
Contributions:		
Member contributions.....	\$ 48,445,698	\$ 45,984,957
Employer contributions.....	129,763,555	120,683,218
Other contributions.....	10,764,996	9,513,101
Total contributions.....	188,974,249	176,181,276
Net investment income (loss):		
Total investment income (loss).....	215,642,272	(24,002,304)
Less, investment expenses.....	(7,319,761)	(7,072,407)
Net investment income (loss).....	208,322,511	(31,074,711)
Total additions.....	397,296,760	145,106,565
Deductions:		
Administration.....	2,754,384	2,645,568
Retirement benefits, refunds and transfers.....	178,455,859	170,144,282
Building operations and maintenance.....	279,208	309,357
Depreciation.....	318,812	318,812
Total deductions.....	181,808,263	173,418,019
Net increase (decrease) in fiduciary net position....	215,488,497	(28,311,454)
Fiduciary net position at beginning of year.....	1,350,039,765	1,378,351,219
Fiduciary net position at end of year.....	\$ 1,565,528,262	\$ 1,350,039,765

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, 2019

Assets	
Cash and cash equivalents.....	\$ 40,093,110
Investments:	
Investments in Pension Reserve Investment Trust...	1,507,621,397
Other Investments.....	<u>5,227,921</u>
Total investments.....	<u>1,512,849,318</u>
Receivables, net of allowance for uncollectibles:	
Member deductions.....	2,518,769
Member contributions.....	35,558
Employer pension appropriation.....	830,947
Reimbursements from other systems.....	3,896,021
Member make-up payments and redeposits.....	208,849
Other accounts receivable.....	<u>620,832</u>
Total Receivables.....	<u>8,110,976</u>
Capital assets, net of accumulated depreciation.....	<u>4,722,962</u>
Total Assets.....	<u>1,565,776,366</u>
Liabilities	
Accounts payable.....	142,242
Other liabilities.....	<u>105,862</u>
Total Liabilities.....	<u>248,104</u>
Net Position Restricted for Pensions.....	\$ <u><u>1,565,528,262</u></u>

See notes to financial statements.

STATEMENT OF CHANGES IN FIDUCIARY NET POSITION

YEAR ENDED DECEMBER 31, 2019

Additions:

Contributions:

Employer pension appropriation.....	\$	129,685,755
Member contributions.....		48,445,698
Transfers from other systems.....		6,071,001
3(8)(c) contributions from other systems.....		3,821,057
Workers' compensation settlements.....		77,800
Members' makeup payments and redeposits.....		725,233
Interest not refunded.....		147,705

Total contributions..... 188,974,249

Net investment income:

Investment income (loss).....	215,642,272
Less: investment expense.....	<u>(7,319,761)</u>

Net investment income (loss)..... 208,322,511

Total additions..... 397,296,760

Deductions:

Administration.....	2,754,384
Building operations and maintenance.....	279,208
Retirement benefits and refunds.....	161,550,304
Transfers to other systems.....	5,611,885
3(8)(c) transfer to other systems.....	11,293,670
Depreciation.....	<u>318,812</u>

Total deductions..... 181,808,263

Net increase (decrease) in fiduciary net position..... 215,488,497

Fiduciary net position at beginning of year..... 1,350,039,765

Fiduciary net position at end of year..... \$ 1,565,528,262

See notes to financial statements.

NOTE 1 – PLAN DESCRIPTION

The Middlesex County Retirement System is a multiple-employer, cost-sharing, contributory defined benefit pension plan covering all employees of the governmental member units deemed eligible by the Middlesex County Retirement Board (the Board), with the exception of school department employees who serve in a teaching capacity. The pensions of such school employees are administered by the Commonwealth of Massachusetts' Teachers Retirement System. Membership in the System is mandatory immediately upon the commencement of employment for all permanent employees working a minimum of 20 hours per week and who are paid annual compensation of no less than \$5,000. As of January 1, 2020, the System had 71 participating employers.

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

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

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

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

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

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

Administrative expenses are paid from investment income.

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

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

NOTE 2 – SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

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

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

Cash and Investments

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

Fair Value Measurements

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

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

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

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

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

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

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

Accounts Receivable

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

Deferred Outflows/Inflows of Resources

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

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

NOTE 3 – PLAN ADMINISTRATION

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

Chairman	Thomas F. Gibson	Term Expires:	12/31/2020
Advisory Council Member	Brian P. Curtin	Term Expires:	12/31/2021
Elected Member	John Brown	Term Expires:	12/31/2020
Elected Member	Joseph W. Kearns	Term Expires:	12/31/2022
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, 2019, the carrying amount of the System's deposits totaled \$38,412,396, and the bank balance totaled \$40,397,450, all of which was covered by Federal Depository Insurance.

Investments

The System's investments are as follows:

<u>Investment Type</u>	<u>December 31, 2019</u>
PRIT Pooled Funds.....	\$ 1,507,621,397
Money Market Mutual Funds.....	1,680,714
Pooled Alternative Investments...	3,421,666
Pooled Real Estate Funds.....	<u>1,806,255</u>
Total Investments.....	<u>\$ 1,514,530,032</u>

Approximately 99.5% 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. The effective weighted duration rate for PRIT investments ranged from 0.14 to 16.03 years.

Approximately 0.3% of the System's funds are invested in pooled alternative investments and pooled real estate funds. The market values of assets in those funds are based on the quoted values obtained from each pool.

Approximately 0.1% 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 16.21%. The money-weighted rate of return expresses investment performance, net of pension plan investment expense, adjusted for the changing amounts actually invested, measured monthly.

Fair Value of Investments

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

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

The System has the following recurring fair value measurements as of December 31, 2019:

Investment Type	12/31/2019	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:				
Money Market Mutual Funds.....	\$ 1,680,714	\$ 1,680,714	\$ -	\$ -
Pooled Alternative Investments.....	3,421,666	-	-	3,421,666
Pooled Real Estate Funds.....	1,806,255	-	-	1,806,255
Total Investments by fair value level.....	6,908,635	\$ 1,680,714	\$ -	\$ 5,227,921
Investments measured at the net asset value (NAV):				
PRIT Investments.....	1,507,621,397			
Total Investments.....	\$ 1,514,530,032			

Money market mutual funds in Level 1 of the fair value hierarchy are valued using prices quoted in active markets for those securities. Pooled alternative investments and pooled real estate funds classified in level 3 are valued using either a discounted cash flow or market comparable company's technique.

PRIT Investments are valued using the net asset value (NAV) method. This investment pool was established by

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

NOTE 6 – CAPITAL ASSETS

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

Capital Asset Type	Estimated Useful Life (in years)
Building.....	40
Building improvements....	40
Vehicles.....	5
PTG Software.....	5

Capital asset activity for the year ended December 31, 2019, was as follows:

	Beginning Balance	Increases	Decreases	Ending Balance
<u>Capital assets not being depreciated:</u>				
Land.....	\$ 672,657	\$ -	\$ -	\$ 672,657
<u>Capital assets being depreciated:</u>				
Buildings.....	5,417,136	-	-	5,417,136
Building improvements.....	1,099,492	-	-	1,099,492
Vehicles.....	50,516	-	(19,603)	30,913
PTG Software.....	729,570	-	-	729,570
Total capital assets being depreciated.....	7,296,714	-	(19,603)	7,277,111
<u>Less accumulated depreciation for:</u>				
Buildings.....	(2,171,210)	(135,428)	-	(2,306,638)
Building improvements.....	(434,651)	(27,166)	-	(461,817)
Vehicles.....	(29,907)	(10,304)	19,603	(20,608)
PTG Software.....	(291,828)	(145,915)	-	(437,743)
Total accumulated depreciation.....	(2,927,596)	(318,813)	19,603	(3,226,806)
Total capital assets being depreciated, net.....	4,369,118	(318,813)	-	4,050,305
Total capital assets, net.....	\$ 5,041,775	\$ (318,813)	\$ -	\$ 4,722,962

NOTE 7 – MEMBERSHIP

The following table represents the System's membership at December 31, 2019:

	<u>2019</u>
Active members.....	9,282
Inactive members entitled to a return of their employee contributions.....	3,082
Inactive members with a vested right to a deferred or immediate benefit.....	381
Retirees and beneficiaries currently receiving benefits.....	<u>5,862</u>
Total.....	<u>18,607</u>

NOTE 8 – ACTUARIAL VALUATION

Components of the net pension liability as of December 31, 2019, were as follows:

Total pension liability.....	\$ 3,165,584,277
The pension plan's fiduciary net position.....	<u>1,565,528,262</u>
The net pension liability.....	<u>\$ 1,600,056,015</u>
The pension plan's fiduciary net position as a percentage of the total pension liability.....	49.45%

The total pension liability was determined by an actuarial valuation as of January 1, 2020, using the following actuarial assumptions, applied to all periods included in the measurement that was rolled back to December 31, 2019:

Valuation date.....	January 1, 2020
Actuarial cost method.....	Entry Age Normal Cost Method.
Amortization method.....	Prior year's total contribution increased by 6.50% for fiscal 2020 through fiscal 2027, and thereafter the remaining unfunded liability will be amortized on a 4.00% annual increasing basis; ERI liability amortized in level payments.
Remaining amortization period.....	17 years from July 1, 2018 for non-ERI liability, 1 year from July 1, 2018 for 2002 ERI, 2 years from July 1, 2018 for 2033 ERI, and 4 years from July 1, 2018 for 2010 ERI.
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.
Investment rate of return/Discount rate..	7.30%, net of pension plan investment expense, including inflation previously 7.50%

Inflation rate.....	3.25%
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.....	3.00% of the first \$16,000 of retirement income, as of July 1, 2019.
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 policy: The System'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 System's target asset allocation as of January 1, 2020, are summarized in the following table:

Asset Class	Long-Term Expected Asset Allocation	Long-Term Expected Real Rate of Return
Domestic equity.....	21.00%	6.15%
International developed markets equity.....	13.00%	6.78%
International emerging markets equity.....	5.00%	8.65%
Core fixed income.....	15.00%	1.11%
High-yield fixed income.....	8.00%	3.51%
Real estate.....	10.00%	4.33%
Commodities.....	4.00%	4.13%
Hedge funds, GTAA, risk parity.....	11.00%	3.19%
Private equity.....	13.00%	9.99%
	<u>100.00%</u>	

Discount rate: The discount rate used to measure the total pension liability was 7.30%. 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 System'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 7.30%, as well as what the net position liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.30%) or 1-percentage-point higher (8.30%) than the current rate:

	1% Decrease (6.30%)	Current Discount (7.30%)	1% Increase (8.30%)
Middlesex County Retirement System's net pension liability as of December 31, 2019.....	\$ 1,966,342,109	\$ 1,600,056,015	\$ 1,291,835,664

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 are finalizing the amount owed after accounting for the 3(8)(c) reimbursements and COLA reimbursements which were withheld; however, a final payment to resolve the issue has yet to be made.

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

NOTE 10 – IMPLEMENTATION OF GASB PRONOUNCEMENTS

In May of 2020, the GASB issued Statement #95, *Postponement of the Effective Dates of Certain Authoritative Guidance*. The objective of this Statement is to provide temporary relief to governments and other stakeholders in light of the COVID-19 pandemic. This Statement postponed the required implementation of many of the upcoming Statements for one year or longer.

There were no GASB pronouncements required to be implemented in 2019 that impacted the System's financial statements.

None of the issued GASB statements that are required to be implemented in future years are anticipated to impact the System's financial statements.

NOTE 11 – SUBSEQUENT EVENTS

Management has evaluated subsequent events through August 20, 2020, which is the date the financial statements were available to be issued.

Required Supplementary Information

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

	December 31, 2014	December 31, 2015	December 31, 2016	December 31, 2017	December 31, 2018	December 31, 2019
Total pension liability:						
Service cost.....	\$ 52,132,389	\$ 54,217,685	\$ 56,386,392	\$ 60,585,598	\$ 64,615,910	\$ 66,816,001
Interest.....	172,094,226	179,703,272	187,359,948	200,298,121	208,614,148	216,905,943
Changes in benefit terms.....	-	-	-	-	-	29,156,339
Differences between expected and actual experience.....	-	-	7,976,453	(9,059,393)	-	46,671,873
Changes in assumptions.....	-	-	96,500,754	97,195,824	-	65,013,900
Benefit payments.....	(125,082,678)	(134,295,504)	(143,428,636)	(150,780,931)	(161,259,804)	(168,486,003)
Net change in total pension liability.....	99,143,937	99,625,453	204,794,909	198,239,219	111,970,254	256,078,053
Total pension liability - beginning.....	<u>2,195,732,452</u>	<u>2,294,876,389</u>	<u>2,394,501,842</u>	<u>2,599,296,751</u>	<u>2,797,535,970</u>	<u>2,909,506,224</u>
Total pension liability - ending (a).....	\$ <u>2,294,876,389</u>	\$ <u>2,394,501,842</u>	\$ <u>2,599,296,751</u>	\$ <u>2,797,535,970</u>	\$ <u>2,909,506,224</u>	\$ <u>3,165,584,277</u>
Plan fiduciary net position:						
Employer pension appropriation.....	\$ 93,368,685	\$ 99,792,641	\$ 107,032,211	\$ 115,377,205	\$ 120,614,676	\$ 129,685,755
Member contributions.....	39,048,869	40,340,741	42,015,296	44,177,815	45,984,957	48,445,698
Other contributions.....	6,405,881	8,668,378	12,337,414	10,405,773	9,581,643	10,842,796
Net investment income (loss).....	74,904,315	7,732,128	74,917,546	189,343,574	(31,074,711)	208,322,511
Administrative expenses.....	(2,956,390)	(2,824,803)	(3,062,521)	(2,619,464)	(2,645,568)	(2,754,384)
Building operations and maintenance.....	(381,899)	(302,771)	(235,687)	(306,177)	(309,357)	(279,208)
Retirement benefits and refunds.....	(125,082,678)	(134,295,504)	(143,428,636)	(150,780,931)	(161,259,804)	(168,486,003)
Other retirement deductions.....	(5,556,930)	(8,025,993)	(11,475,752)	(9,358,262)	(8,884,478)	(9,969,856)
Depreciation.....	(162,594)	(162,594)	(162,594)	(308,508)	(318,812)	(318,812)
Net increase (decrease) in fiduciary net position.....	79,547,259	10,922,223	77,937,297	195,931,025	(28,311,454)	215,488,497
Fiduciary net position - beginning of year.....	<u>1,014,013,415</u>	<u>1,093,560,674</u>	<u>1,104,482,897</u>	<u>1,182,420,194</u>	<u>1,378,351,219</u>	<u>1,350,039,765</u>
Fiduciary net position - end of year (b).....	\$ <u>1,093,560,674</u>	\$ <u>1,104,482,897</u>	\$ <u>1,182,420,194</u>	\$ <u>1,378,351,219</u>	\$ <u>1,350,039,765</u>	\$ <u>1,565,528,262</u>
Net pension liability - ending (a)-(b).....	\$ 1,201,315,715	\$ 1,290,018,945	\$ 1,416,876,557	\$ 1,419,184,751	\$ 1,559,466,459	\$ 1,600,056,015
Plan fiduciary net position as a percentage of the total pension liability.....	47.65%	46.13%	45.49%	49.27%	46.40%	49.45%
Covered payroll.....	\$ 415,752,810	\$ 432,382,921	\$ 439,644,322	\$ 451,777,105	\$ 471,115,185	\$ 492,109,775
Net pension liability as a percentage of covered payroll.....	288.95%	298.35%	322.28%	314.13%	331.02%	325.14%

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

Year	Actuarially determined contribution	Contributions in relation to the actuarially determined contribution	Contribution deficiency (excess)	Covered payroll	Contributions as a percentage of covered payroll
December 31, 2019	\$ 127,151,838	\$ (129,685,754)	\$ (2,533,916)	\$ 492,109,775	26.35%
December 31, 2018	119,298,291	(120,614,676)	(1,316,385)	471,115,185	25.60%
December 31, 2017	112,017,087	(115,426,815)	(3,409,728)	451,777,105	25.55%
December 31, 2016	105,246,797	(107,067,707)	(1,820,910)	439,644,322	24.35%
December 31, 2015	98,792,642	(99,820,481)	(1,027,839)	432,382,921	23.09%
December 31, 2014	92,826,743	(93,400,946)	(574,203)	415,752,810	22.47%

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

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, 2019.....	16.21%
December 31, 2018.....	-2.52%
December 31, 2017.....	17.25%
December 31, 2016.....	7.35%
December 31, 2015.....	0.61%
December 31, 2014.....	7.54%

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

See notes to required supplementary information.

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

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

NOTE B – CONTRIBUTIONS

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

NOTE C – MONEY WEIGHTED RATE OF RETURN

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

NOTE D – CHANGES IN ASSUMPTIONS AND PLAN PROVISIONS

The following changes were reflected in the January 1, 2020 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.50% to 7.30%.

Changes in Plan Provisions

- As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$16,000 as of July 1, 2019.

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, 2019, 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, 2019, 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, 2019, 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, 2019, and our report thereon, dated August 20, 2020, expressed an unmodified opinion on those financial statements.

Restriction on Use

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



August 20, 2020

SCHEDULE OF EMPLOYER ALLOCATIONS

FOR THE YEAR ENDED DECEMBER 31, 2019

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	54,966,604	3.435292%
Town of Ashby	1,941,210	0.121321%
Town of Bedford	37,703,972	2.356416%
Town of Ayer	20,395,526	1.274678%
Town of Billerica	54,291,514	3.393101%
Town of Boxborough	157,213,941	9.825527%
Town of Burlington	12,546,753	0.784145%
Town of Carlisle	137,604,549	8.599983%
Town of Chelmsford	11,101,958	0.693848%
Town of Chelmsford	114,671,152	7.166696%
Town of Dracut	68,887,607	4.305325%
Town of Dunstable	3,317,391	0.207330%
Town of Groton	25,513,416	1.584533%
Town of Holliston	26,676,612	1.667230%
Town of Hopkinton	26,064,382	1.630217%
Town of Hudson	69,381,303	4.336180%
Town of Lincoln	27,767,333	1.735398%
Town of Littleton	26,056,611	1.628481%
Town of North Reading	52,178,434	3.261038%
Town of Pepperell	18,312,861	1.144514%
Town of Sherborn	10,450,215	0.653116%
Town of Shirley	9,325,501	0.582823%
Town of Stow	11,909,143	0.744295%
Town of Sudbury	64,188,721	4.011530%
Town of Tewksbury	107,519,124	6.719710%
Town of Townsend	8,637,189	0.538805%
Town of Tyngsborough	25,022,982	1.563882%
Town of Wayland	59,191,196	3.699320%
Town of Westford	59,489,841	3.717985%
Town of Weston	67,631,236	4.226804%
Town of Wilmington	91,654,915	5.728232%
Acton-Boxborough Regional School District	31,360,095	1.959935%
Acton Water Supply	3,732,674	0.233284%
Bedford Housing Authority	332,568	0.020785%
Billerica Housing Authority	1,647,782	0.102682%
Chelmsford Housing Authority	2,275,176	0.142194%
Chelmsford Water District	343,766	0.021485%
Dracut Housing Authority	2,317,408	0.144833%
Dracut Water Supply	3,356,809	0.209793%
East Chelmsford Water District	395,631	0.024726%
East Middlesex Mosquito Control	712,131	0.044507%
Greater Lowell Regional Vocational Technical School District	18,372,432	1.148237%
Groton-Dunstable Regional School District	13,046,678	0.815389%
Hudson Housing Authority	704,593	0.044036%
Lincoln-Sudbury Regional School District	9,128,061	0.570359%
Nashoba Valley Technical High School District	3,735,397	0.234544%
North Chelmsford Water District	1,074,652	0.067163%
North Middlesex Regional School District	13,400,780	0.837519%
Shawsheen Valley Regional Vocational School	8,870,284	0.554373%
South Middlesex Regional Vocational Technical School	7,027,195	0.439184%
Sudbury Water District	2,571,703	0.160726%
Tewksbury Housing Authority	1,723,517	0.107716%
Wayland Housing Authority	675,758	0.042233%
Hopkinton Housing Authority	537,329	0.033582%
Sudbury Housing Authority	490,188	0.030636%
Wilmington Housing Authority	382,144	0.023883%
Acton Housing Authority	907,630	0.056725%
Burlington Housing Authority	345,712	0.021606%
Ayer Housing Authority	879,177	0.054847%
Holliston Housing Authority	175,571	0.010973%
Littleton Housing Authority	621,840	0.038864%
Westford Housing Authority	570,710	0.035668%
Shirley Water District	484,781	0.030298%
Tyngsborough Housing Authority	528,855	0.033052%
Pepperell Housing Authority	251,415	0.015713%
Groton Housing Authority	-	0.000000%
Tyngsborough Water District	481,728	0.030107%
North Reading Housing Authority	214,226	0.013389%
West Groton Water	36,784	0.002299%
Ayer-Shirley Regional School District	4,713,693	0.294595%
Total	\$ 1,600,056,015	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, 2019

	Middlesex County Retirement Board	Middlesex County	Middlesex Hospital	Town of Acton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 53,545,751
Ending net pension liability/(asset).....	\$ -	\$ -	\$ -	\$ 54,966,604
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 1,337,455
Changes of assumptions.....	-	-	-	3,785,335
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	1,201,177
Total Deferred Outflows of Resources.....	\$ -	\$ -	\$ -	\$ 6,323,967
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ -	\$ -	\$ 124,487
Net difference between projected and actual investment earnings on pension plan investments.....	-	-	-	1,426,379
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	1,136,670
Total Deferred Inflows of Resources.....	\$ -	\$ -	\$ -	\$ 2,687,536
Pension Expense				
Proportionate share of plan pension expense.....	\$ 351,211	\$ -	\$ -	\$ 7,905,662
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	-	-	(182,195)
Total Employer Pension Expense.....	\$ 351,211	\$ -	\$ -	\$ 7,723,467
Contributions				
Statutory required contribution.....	\$ 351,211	\$ -	\$ -	\$ 4,229,480
Contribution in relation to statutory required contribution.....	(351,211)	-	-	(4,236,342)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (6,862)
Contributions as a percentage of covered payroll.....	26.11%	0.00%	0.00%	29.09%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ -	\$ -	\$ -	\$ 1,492,083
June 30, 2022.....	-	-	-	1,213,723
June 30, 2023.....	-	-	-	934,713
June 30, 2024.....	-	-	-	(4,088)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ -	\$ -	\$ -	\$ 3,636,431
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ -	\$ -	\$ -	\$ 67,549,603
Current discount rate (7.30%).....	\$ -	\$ -	\$ -	\$ 54,966,604
1% increase (8.30%).....	\$ -	\$ -	\$ -	\$ 44,378,333
Covered Payroll.....	\$ 1,345,329	\$ -	\$ -	\$ 14,564,884
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, 2019

	Town of Ashby	Town of Ashland	Town of Ayer	Town of Bedford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 2,175,376	\$ 36,199,958	\$ 20,317,285	\$ 55,208,123
Ending net pension liability/(asset).....	\$ 1,941,210	\$ 37,703,972	\$ 20,395,526	\$ 54,291,514
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 47,234	\$ 917,418	\$ 496,267	\$ 1,321,029
Changes of assumptions.....	133,684	2,596,525	1,404,560	3,738,844
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	331,267	1,487,824	672,369	390,107
Total Deferred Outflows of Resources.....	\$ 512,185	\$ 5,001,767	\$ 2,573,196	\$ 5,449,980
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 4,396	\$ 85,391	\$ 46,191	\$ 122,958
Net difference between projected and actual investment earnings on pension plan investments.....	50,374	978,415	529,262	1,408,861
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	275,943	-	721,875	2,281,555
Total Deferred Inflows of Resources.....	\$ 330,713	\$ 1,063,806	\$ 1,297,328	\$ 3,813,374
Pension Expense				
Proportionate share of plan pension expense.....	\$ 279,198	\$ 5,422,836	\$ 2,933,420	\$ 7,808,566
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	41,070	912,073	(90,868)	(762,273)
Total Employer Pension Expense.....	\$ 320,268	\$ 6,334,909	\$ 2,842,552	\$ 7,046,293
Contributions				
Statutory required contribution.....	\$ 237,579	\$ 3,054,672	\$ 1,687,582	\$ 4,469,908
Contribution in relation to statutory required contribution.....	(237,579)	(3,086,828)	(1,687,582)	(4,470,165)
Contribution deficiency/(excess).....	\$ -	\$ (32,156)	\$ -	\$ (257)
Contributions as a percentage of covered payroll.....	21.34%	21.29%	23.32%	22.79%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 78,474	\$ 1,925,048	\$ 504,435	\$ 921,444
June 30, 2022.....	102,402	977,590	477,440	432,124
June 30, 2023.....	34,026	907,208	352,715	645,057
June 30, 2024.....	(33,430)	128,115	(58,722)	(362,019)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 181,472	\$ 3,937,961	\$ 1,275,868	\$ 1,636,606
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 2,385,593	\$ 46,335,195	\$ 25,064,486	\$ 66,719,971
Current discount rate (7.30%).....	\$ 1,941,210	\$ 37,703,972	\$ 20,395,526	\$ 54,291,514
1% increase (8.30%).....	\$ 1,567,273	\$ 30,441,019	\$ 16,466,716	\$ 43,833,287
Covered Payroll.....	\$ 1,113,135	\$ 14,500,500	\$ 7,236,067	\$ 19,611,792
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, 2019

	Town of Billerica	Town of Boxborough	Town of Burlington	Town of Carlisle
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 150,770,372	\$ 11,266,225	\$ 127,441,167	\$ 11,157,139
Ending net pension liability/(asset).....	\$ 157,213,941	\$ 12,546,753	\$ 137,604,549	\$ 11,101,958
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 3,825,352	\$ 305,289	\$ 3,348,213	\$ 270,134
Changes of assumptions.....	10,826,707	864,046	9,476,287	764,548
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,472,890	1,000,048	5,600,583	613,663
Total Deferred Outflows of Resources.....	\$ 17,124,949	\$ 2,169,383	\$ 18,425,083	\$ 1,648,345
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 356,055	\$ 28,415	\$ 311,644	\$ 25,143
Net difference between projected and actual investment earnings on pension plan investments.....	4,079,690	325,587	3,570,828	288,095
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	4,147,868	102,818	2,188,101	445,502
Total Deferred Inflows of Resources.....	\$ 8,583,613	\$ 456,820	\$ 6,070,573	\$ 758,740
Pension Expense				
Proportionate share of plan pension expense.....	\$ 22,611,554	\$ 1,804,557	\$ 19,791,200	\$ 1,596,757
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(994,227)	407,180	710,895	154,825
Total Employer Pension Expense.....	\$ 21,617,327	\$ 2,211,737	\$ 20,502,095	\$ 1,751,582
Contributions				
Statutory required contribution.....	\$ 11,921,516	\$ 943,152	\$ 10,023,321	\$ 991,823
Contribution in relation to statutory required contribution.....	(11,921,516)	(943,152)	(10,023,321)	(991,823)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	32.22%	27.79%	28.31%	17.14%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 4,273,499	\$ 775,140	\$ 5,117,452	\$ 416,985
June 30, 2022.....	1,465,619	395,572	3,145,891	207,138
June 30, 2023.....	2,427,112	376,445	3,035,635	300,298
June 30, 2024.....	375,106	165,406	1,055,532	(34,816)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 8,541,336	\$ 1,712,563	\$ 12,354,510	\$ 889,605
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 193,203,481	\$ 15,418,966	\$ 169,105,092	\$ 13,643,427
Current discount rate (7.30%).....	\$ 157,213,941	\$ 12,546,753	\$ 137,604,549	\$ 11,101,958
1% increase (8.30%).....	\$ 126,929,664	\$ 10,129,860	\$ 111,097,850	\$ 8,963,377
Covered Payroll.....	\$ 37,001,063	\$ 3,393,712	\$ 35,400,619	\$ 5,787,456
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, 2019

	Town of Chelmsford	Town of Dracut	Town of Dunstable	Town of Groton
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 110,995,199	\$ 65,601,775	\$ 2,958,745	\$ 23,290,688
Ending net pension liability/(asset).....	\$ 114,671,152	\$ 68,887,607	\$ 3,317,391	\$ 25,513,416
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 2,790,195	\$ 1,676,183	\$ 80,719	\$ 620,794
Changes of assumptions.....	7,896,954	4,744,020	228,456	1,757,009
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>1,872,541</u>	<u>1,940,809</u>	<u>416,355</u>	<u>1,421,500</u>
Total Deferred Outflows of Resources.....	\$ <u>12,559,690</u>	\$ <u>8,361,012</u>	\$ <u>725,530</u>	\$ <u>3,799,303</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 259,704	\$ 156,014	\$ 7,513	\$ 57,782
Net difference between projected and actual investment earnings on pension plan investments.....	2,975,708	1,787,630	86,086	662,071
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>2,182,213</u>	<u>708,170</u>	<u>78,903</u>	<u>599,117</u>
Total Deferred Inflows of Resources.....	\$ <u>5,417,625</u>	\$ <u>2,651,814</u>	\$ <u>172,502</u>	\$ <u>1,318,970</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 16,492,767	\$ 9,907,873	\$ 477,129	\$ 3,669,509
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(494,360)</u>	<u>458,182</u>	<u>89,762</u>	<u>101,673</u>
Total Employer Pension Expense.....	\$ <u>15,998,407</u>	\$ <u>10,366,055</u>	\$ <u>566,891</u>	\$ <u>3,771,182</u>
Contributions				
Statutory required contribution.....	\$ 8,872,242	\$ 5,348,633	\$ 274,244	\$ 1,973,053
Contribution in relation to statutory required contribution.....	<u>(9,272,242)</u>	<u>(5,348,633)</u>	<u>(275,072)</u>	<u>(1,973,053)</u>
Contribution deficiency/(excess).....	\$ <u>(400,000)</u>	\$ <u>-</u>	\$ <u>(828)</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	33.21%	32.01%	19.04%	24.75%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 3,340,143	\$ 2,579,458	\$ 178,781	\$ 921,879
June 30, 2022.....	2,014,750	1,547,431	191,209	552,548
June 30, 2023.....	1,581,451	1,310,223	130,573	726,736
June 30, 2024.....	<u>205,721</u>	<u>272,086</u>	<u>52,465</u>	<u>279,170</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>7,142,065</u>	\$ <u>5,709,198</u>	\$ <u>553,028</u>	\$ <u>2,480,333</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 140,921,763	\$ 84,657,413	\$ 4,076,811	\$ 31,353,967
Current discount rate (7.30%).....	\$ 114,671,152	\$ 68,887,607	\$ 3,317,391	\$ 25,513,416
1% increase (8.30%).....	\$ 92,581,936	\$ 55,617,720	\$ 2,678,359	\$ 20,598,742
Covered Payroll.....	\$ 27,918,845	\$ 16,709,878	\$ 1,444,438	\$ 7,971,673
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, 2019

	Town of Holliston	Town of Hopkinton	Town of Hudson	Town of Lincoln
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 27,349,059	\$ 25,369,330	\$ 69,719,052	\$ 27,722,484
Ending net pension liability/(asset).....	\$ 26,676,612	\$ 26,084,382	\$ 69,381,303	\$ 27,767,333
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 649,099	\$ 634,689	\$ 1,688,196	\$ 675,639
Changes of assumptions.....	1,837,114	1,796,329	4,778,019	1,912,228
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	940,604	1,846,714	547,946	250,027
Total Deferred Outflows of Resources.....	\$ 3,426,817	\$ 4,277,732	\$ 7,014,161	\$ 2,837,894
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 60,416	\$ 59,075	\$ 157,133	\$ 62,887
Net difference between projected and actual investment earnings on pension plan investments.....	692,256	676,888	1,800,440	720,560
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	1,390,777	270,816	1,589,249	821,479
Total Deferred Inflows of Resources.....	\$ 2,143,449	\$ 1,006,779	\$ 3,546,822	\$ 1,604,926
Pension Expense				
Proportionate share of plan pension expense.....	\$ 3,836,808	\$ 3,751,629	\$ 9,978,880	\$ 3,993,682
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(112,665)	815,351	(164,006)	(193,557)
Total Employer Pension Expense.....	\$ 3,724,143	\$ 4,566,980	\$ 9,814,874	\$ 3,800,125
Contributions				
Statutory required contribution.....	\$ 2,250,407	\$ 2,335,018	\$ 5,798,334	\$ 2,274,023
Contribution in relation to statutory required contribution.....	(2,332,595)	(2,341,404)	(5,804,347)	(2,274,023)
Contribution deficiency/(excess).....	\$ (82,188)	\$ (6,386)	\$ (6,013)	\$ -
Contributions as a percentage of covered payroll.....	20.49%	14.37%	26.77%	21.56%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 583,903	\$ 1,308,351	\$ 1,913,022	\$ 605,959
June 30, 2022.....	408,547	696,684	929,986	276,095
June 30, 2023.....	481,307	994,351	919,447	446,601
June 30, 2024.....	(190,389)	71,567	(295,116)	(95,687)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,283,368	\$ 3,270,953	\$ 3,467,339	\$ 1,232,968
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 32,783,443	\$ 32,055,639	\$ 85,264,126	\$ 34,123,853
Current discount rate (7.30%).....	\$ 26,676,612	\$ 26,084,382	\$ 69,381,303	\$ 27,767,333
1% increase (8.30%).....	\$ 21,537,870	\$ 21,059,722	\$ 56,016,315	\$ 22,418,485
Covered Payroll.....	\$ 11,384,973	\$ 18,296,923	\$ 21,683,348	\$ 10,549,034
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, 2019

	Town of Littleton	Town of North Reading	Town of Pepperell	Town of Sherborn
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 25,332,249	\$ 52,331,338	\$ 17,953,081	\$ 11,725,506
Ending net pension liability/(asset).....	\$ 26,056,611	\$ 52,178,434	\$ 18,312,861	\$ 10,450,215
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 634,013	\$ 1,269,613	\$ 445,591	\$ 254,276
Changes of assumptions.....	1,794,417	3,593,325	1,261,135	719,665
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>2,836,447</u>	<u>167,040</u>	<u>446,020</u>	<u>317,310</u>
Total Deferred Outflows of Resources.....	\$ <u>5,264,877</u>	\$ <u>5,029,978</u>	\$ <u>2,152,746</u>	\$ <u>1,291,251</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 59,012	\$ 118,172	\$ 41,474	\$ 23,667
Net difference between projected and actual investment earnings on pension plan investments.....	676,167	1,354,026	475,217	271,182
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>921,507</u>	<u>1,731,036</u>	<u>261,895</u>	<u>1,286,104</u>
Total Deferred Inflows of Resources.....	\$ <u>1,656,686</u>	\$ <u>3,203,234</u>	\$ <u>778,586</u>	\$ <u>1,580,953</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 3,747,635	\$ 7,504,649	\$ 2,633,877	\$ 1,503,019
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>894,825</u>	<u>(626,051)</u>	<u>381,916</u>	<u>(281,130)</u>
Total Employer Pension Expense.....	\$ <u>4,642,460</u>	\$ <u>6,878,598</u>	\$ <u>3,015,793</u>	\$ <u>1,221,889</u>
Contributions				
Statutory required contribution.....	\$ 2,206,947	\$ 4,161,014	\$ 1,454,092	\$ 1,018,037
Contribution in relation to statutory required contribution.....	<u>(3,086,111)</u>	<u>(4,161,014)</u>	<u>(1,455,491)</u>	<u>(1,018,037)</u>
Contribution deficiency/(excess).....	\$ <u>(879,164)</u>	\$ <u>-</u>	\$ <u>(1,399)</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	23.53%	30.25%	29.99%	23.23%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 1,494,286	\$ 1,061,788	\$ 889,463	\$ 16,233
June 30, 2022.....	881,183	488,305	210,803	(58,114)
June 30, 2023.....	1,009,987	521,335	286,963	(13,027)
June 30, 2024.....	<u>222,735</u>	<u>(244,684)</u>	<u>(12,869)</u>	<u>(234,794)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>3,608,191</u>	\$ <u>1,826,744</u>	\$ <u>1,374,160</u>	\$ <u>(289,702)</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 32,021,511	\$ 64,123,163	\$ 22,505,056	\$ 12,842,487
Current discount rate (7.30%).....	\$ 26,056,611	\$ 52,178,434	\$ 18,312,861	\$ 10,450,215
1% increase (8.30%).....	\$ 21,037,301	\$ 42,127,251	\$ 14,785,237	\$ 8,437,180
Covered Payroll.....	\$ 13,118,371	\$ 13,756,949	\$ 4,853,532	\$ 4,382,868
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, 2019

	Town of Shirley	Town of Stow	Town of Sudbury	Town of Tewksbury
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 9,113,056	\$ 11,645,337	\$ 63,931,576	\$ 104,461,551
Ending net pension liability/(asset).....	\$ 9,325,501	\$ 11,909,143	\$ 64,186,721	\$ 107,519,124
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 226,909	\$ 289,775	\$ 1,561,800	\$ 2,616,171
Changes of assumptions.....	642,211	820,136	4,420,288	7,404,421
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	130,529	138,173	829,093	1,803,116
Total Deferred Outflows of Resources.....	\$ 999,649	\$ 1,248,084	\$ 6,811,181	\$ 11,823,708
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 21,120	\$ 26,971	\$ 145,368	\$ 243,506
Net difference between projected and actual investment earnings on pension plan investments.....	241,996	309,041	1,665,641	2,790,113
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	461,149	76,929	2,111,917	2,027,650
Total Deferred Inflows of Resources.....	\$ 724,265	\$ 412,941	\$ 3,922,926	\$ 5,061,269
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,341,255	\$ 1,712,852	\$ 9,231,760	\$ 15,464,115
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(262,490)	67,330	(466,045)	(206,362)
Total Employer Pension Expense.....	\$ 1,078,765	\$ 1,780,182	\$ 8,765,715	\$ 15,257,753
Contributions				
Statutory required contribution.....	\$ 785,020	\$ 957,695	\$ 5,026,152	\$ 8,545,236
Contribution in relation to statutory required contribution.....	(785,020)	(957,695)	(5,026,152)	(8,553,198)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ (7,962)
Contributions as a percentage of covered payroll.....	39.11%	27.06%	28.13%	36.79%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 32,089	\$ 420,012	\$ 1,633,379	\$ 3,426,677
June 30, 2022.....	72,978	194,011	858,571	1,902,851
June 30, 2023.....	162,871	221,915	636,481	1,337,797
June 30, 2024.....	7,446	(795)	(240,176)	95,114
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 275,384	\$ 835,143	\$ 2,888,255	\$ 6,762,439
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 11,460,302	\$ 14,635,393	\$ 78,880,396	\$ 132,132,487
Current discount rate (7.30%).....	\$ 9,325,501	\$ 11,909,143	\$ 64,186,721	\$ 107,519,124
1% increase (8.30%).....	\$ 7,529,121	\$ 9,615,073	\$ 51,822,370	\$ 86,807,610
Covered Payroll.....	\$ 2,007,108	\$ 3,539,435	\$ 17,867,775	\$ 23,249,584
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, 2019

	Town of Townsend	Town of Tyngsborough	Town of Wayland	Town of Westford
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 9,256,011	\$ 23,277,997	\$ 59,255,947	\$ 59,376,424
Ending net pension liability/(asset).....	\$ 8,637,189	\$ 25,022,982	\$ 59,191,196	\$ 59,489,841
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 210,161	\$ 608,863	\$ 1,440,249	\$ 1,447,515
Changes of assumptions.....	594,809	1,723,235	4,076,266	4,096,833
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	580,163	1,624,260	253,730	2,155,101
Total Deferred Outflows of Resources.....	\$ 1,385,133	\$ 3,956,358	\$ 5,770,245	\$ 7,699,449
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 19,561	\$ 56,671	\$ 134,054	\$ 134,731
Net difference between projected and actual investment earnings on pension plan investments.....	224,134	649,344	1,536,007	1,543,757
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	992,365	717,689	2,297,638	1,463,064
Total Deferred Inflows of Resources.....	\$ 1,236,060	\$ 1,423,704	\$ 3,967,699	\$ 3,141,552
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,242,258	\$ 3,598,971	\$ 8,513,271	\$ 8,556,224
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	12,398	543,313	(1,024,928)	666,524
Total Employer Pension Expense.....	\$ 1,254,656	\$ 4,142,284	\$ 7,488,343	\$ 9,222,748
Contributions				
Statutory required contribution.....	\$ 854,966	\$ 2,014,919	\$ 4,862,852	\$ 5,152,765
Contribution in relation to statutory required contribution.....	(854,966)	(2,018,021)	(4,863,333)	(5,154,547)
Contribution deficiency/(excess).....	\$ -	\$ (3,102)	\$ (461)	\$ (1,782)
Contributions as a percentage of covered payroll.....	23.95%	23.11%	24.25%	19.92%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 219,985	\$ 1,223,434	\$ 791,218	\$ 2,209,540
June 30, 2022.....	(71,213)	377,685	416,360	1,137,700
June 30, 2023.....	113,772	718,993	824,469	1,356,041
June 30, 2024.....	(113,471)	212,542	(229,501)	(145,384)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 149,073	\$ 2,532,654	\$ 1,802,546	\$ 4,557,897
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 10,614,421	\$ 30,751,263	\$ 72,741,292	\$ 73,108,303
Current discount rate (7.30%).....	\$ 8,637,189	\$ 25,022,982	\$ 59,191,196	\$ 59,489,841
1% increase (8.30%).....	\$ 6,973,399	\$ 20,202,781	\$ 47,789,138	\$ 48,030,255
Covered Payroll.....	\$ 3,570,490	\$ 8,730,626	\$ 20,058,574	\$ 25,881,068
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, 2019

	Town of Weston	Town of Wilmington	Acton- Boxborough Regional School District	Acton Water Supply
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 66,869,588	\$ 90,145,064	\$ 29,957,174	\$ 3,740,627
Ending net pension liability/(asset).....	\$ 67,631,236	\$ 91,654,915	\$ 31,360,065	\$ 3,732,674
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 1,645,613	\$ 2,230,160	\$ 763,058	\$ 90,824
Changes of assumptions.....	4,657,499	6,311,915	2,159,645	257,055
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	-	1,233,552	1,024,054	80,339
Total Deferred Outflows of Resources.....	\$ 6,303,112	\$ 9,775,627	\$ 3,946,757	\$ 428,218
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 153,169	\$ 207,577	\$ 71,023	\$ 8,454
Net difference between projected and actual investment earnings on pension plan investments.....	1,755,025	2,378,438	813,791	96,863
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	2,209,404	1,359,953	141,912	205,041
Total Deferred Inflows of Resources.....	\$ 4,117,598	\$ 3,945,968	\$ 1,026,726	\$ 310,358
Pension Expense				
Proportionate share of plan pension expense.....	\$ 9,727,174	\$ 13,182,419	\$ 4,510,412	\$ 536,858
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,066,473)	(78,801)	477,365	(16,667)
Total Employer Pension Expense.....	\$ 8,660,701	\$ 13,103,618	\$ 4,987,777	\$ 520,191
Contributions				
Statutory required contribution.....	\$ 5,287,887	\$ 7,080,174	\$ 2,615,376	\$ 243,164
Contribution in relation to statutory required contribution.....	(5,287,887)	(8,088,259)	(2,615,376)	(243,164)
Contribution deficiency/(excess).....	\$ -	\$ (1,008,085)	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.69%	34.36%	17.61%	19.84%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 1,125,437	\$ 2,923,985	\$ 1,390,012	\$ 101,838
June 30, 2022.....	361,300	1,517,309	651,181	16,801
June 30, 2023.....	865,255	1,344,099	735,506	27,092
June 30, 2024.....	(186,478)	44,266	143,332	(27,871)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 2,185,514	\$ 5,829,659	\$ 2,920,031	\$ 117,860
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 83,113,432	\$ 112,636,631	\$ 38,539,036	\$ 4,587,161
Current discount rate (7.30%).....	\$ 67,631,236	\$ 91,654,915	\$ 31,360,065	\$ 3,732,674
1% increase (8.30%).....	\$ 54,603,365	\$ 73,999,339	\$ 25,319,145	\$ 3,013,645
Covered Payroll.....	\$ 20,581,451	\$ 23,538,426	\$ 14,855,796	\$ 1,225,561
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, 2019

	Bedford Housing Authority	Billerica Housing Authority	Chelmsford Housing Authority	Chelmsford Water District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 341,646	\$ 1,441,037	\$ 2,441,133	\$ 708,793
Ending net pension liability/(asset).....	\$ 332,568	\$ 1,647,762	\$ 2,275,176	\$ 343,766
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 8,092	\$ 40,094	\$ 55,360	\$ 8,365
Changes of assumptions.....	22,903	113,475	156,682	23,674
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	13,638	152,286	532,561	794,334
Total Deferred Outflows of Resources.....	\$ 44,633	\$ 305,855	\$ 744,603	\$ 826,373
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 753	\$ 3,732	\$ 5,153	\$ 779
Net difference between projected and actual investment earnings on pension plan investments.....	8,630	42,759	59,041	8,921
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	13,959	55,943	175,437	611,103
Total Deferred Inflows of Resources.....	\$ 23,342	\$ 102,434	\$ 239,631	\$ 620,803
Pension Expense				
Proportionate share of plan pension expense.....	\$ 47,832	\$ 236,992	\$ 327,231	\$ 49,443
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	5,658	38,724	182,613	167,292
Total Employer Pension Expense.....	\$ 53,490	\$ 275,716	\$ 509,844	\$ 216,735
Contributions				
Statutory required contribution.....	\$ 32,373	\$ 107,339	\$ 225,881	\$ 63,546
Contribution in relation to statutory required contribution.....	(32,373)	(107,339)	(323,132)	(63,546)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ (97,251)	\$ -
Contributions as a percentage of covered payroll.....	19.26%	26.92%	12.37%	4.52%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 14,254	\$ 92,751	\$ 239,790	\$ 121,793
June 30, 2022.....	4,644	41,997	214,569	59,342
June 30, 2023.....	4,232	43,355	61,449	83,960
June 30, 2024.....	(1,839)	25,318	(10,836)	(59,525)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 21,291	\$ 203,421	\$ 504,972	\$ 205,570
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 408,700	\$ 2,024,969	\$ 2,796,011	\$ 422,461
Current discount rate (7.30%).....	\$ 332,568	\$ 1,647,762	\$ 2,275,176	\$ 343,766
1% increase (8.30%).....	\$ 268,505	\$ 1,330,352	\$ 1,836,907	\$ 277,546
Covered Payroll.....	\$ 168,089	\$ 398,705	\$ 2,612,882	\$ 1,405,409
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, 2019

	Dracut Housing Authority	Dracut Water Supply	East Chelmsford Water District	East Middlesex Mosquito Control
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 2,173,260	\$ 3,288,228	\$ 381,924	\$ 662,694
Ending net pension liability/(asset).....	\$ 2,317,408	\$ 3,356,809	\$ 395,631	\$ 712,131
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 56,387	\$ 81,678	\$ 9,627	\$ 17,328
Changes of assumptions.....	159,591	231,170	27,246	49,042
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	114,604	171,415	24,255	82,980
Total Deferred Outflows of Resources.....	\$ 330,582	\$ 484,263	\$ 61,128	\$ 149,350
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 5,248	\$ 7,602	\$ 896	\$ 1,613
Net difference between projected and actual investment earnings on pension plan investments.....	60,137	87,109	10,267	18,480
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	127,540	175,593	1,818	39,158
Total Deferred Inflows of Resources.....	\$ 192,925	\$ 270,304	\$ 12,981	\$ 59,251
Pension Expense				
Proportionate share of plan pension expense.....	\$ 333,305	\$ 482,798	\$ 56,902	\$ 102,424
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(26,567)	(6,442)	11,847	24,318
Total Employer Pension Expense.....	\$ 306,738	\$ 476,356	\$ 68,749	\$ 126,742
Contributions				
Statutory required contribution.....	\$ 150,496	\$ 229,578	\$ 33,752	\$ 48,048
Contribution in relation to statutory required contribution.....	(150,496)	(229,578)	(33,752)	(48,048)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	36.78%	32.38%	15.88%	13.23%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 60,299	\$ 110,802	\$ 20,236	\$ 34,916
June 30, 2022.....	41,580	88,688	12,920	18,356
June 30, 2023.....	26,498	23,801	13,745	32,694
June 30, 2024.....	9,280	(9,332)	1,246	4,133
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 137,657	\$ 213,959	\$ 48,147	\$ 90,099
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 2,847,911	\$ 4,125,252	\$ 486,199	\$ 875,153
Current discount rate (7.30%).....	\$ 2,317,408	\$ 3,356,809	\$ 395,631	\$ 712,131
1% increase (8.30%).....	\$ 1,871,003	\$ 2,710,184	\$ 319,420	\$ 574,953
Covered Payroll.....	\$ 409,209	\$ 709,022	\$ 215,299	\$ 363,040
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, 2019

	Greater Lowell Regional Vocation Technical School District	Groton- Dunstable Regional School District	Hudson Housing Authority	Lincoln- Sudbury Regional School District
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 16,800,249	\$ 12,305,499	\$ 1,223,133	\$ 9,231,680
Ending net pension liability/(asset).....	\$ 18,372,432	\$ 13,046,678	\$ 704,593	\$ 9,126,061
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 447,041	\$ 317,454	\$ 17,144	\$ 222,057
Changes of assumptions.....	1,265,238	898,474	48,523	628,476
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>1,039,315</u>	<u>862,403</u>	<u>38,077</u>	<u>102,068</u>
Total Deferred Outflows of Resources.....	\$ <u>2,751,594</u>	\$ <u>2,078,331</u>	\$ <u>103,744</u>	\$ <u>952,601</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 41,609	\$ 29,546	\$ 1,596	\$ 20,668
Net difference between projected and actual investment earnings on pension plan investments.....	476,763	338,560	18,284	236,821
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>682,815</u>	<u>55,874</u>	<u>528,413</u>	<u>472,168</u>
Total Deferred Inflows of Resources.....	\$ <u>1,201,187</u>	\$ <u>423,982</u>	\$ <u>548,293</u>	\$ <u>729,657</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 2,642,445	\$ 1,876,460	\$ 101,339	\$ 1,312,571
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(76,011)</u>	<u>455,058</u>	<u>(172,625)</u>	<u>(177,490)</u>
Total Employer Pension Expense.....	\$ <u>2,566,434</u>	\$ <u>2,331,518</u>	\$ <u>(71,286)</u>	\$ <u>1,135,081</u>
Contributions				
Statutory required contribution.....	\$ 1,215,091	\$ 1,022,579	\$ 91,276	\$ 704,071
Contribution in relation to statutory required contribution.....	<u>(1,215,091)</u>	<u>(1,022,579)</u>	<u>(91,276)</u>	<u>(704,071)</u>
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	28.26%	26.23%	25.54%	24.38%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 529,355	\$ 780,455	\$ (141,926)	\$ 127,381
June 30, 2022.....	471,779	421,681	(131,773)	90,538
June 30, 2023.....	394,468	377,490	(82,144)	66,673
June 30, 2024.....	<u>154,805</u>	<u>74,723</u>	<u>(88,706)</u>	<u>(61,648)</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>1,550,407</u>	\$ <u>1,654,349</u>	\$ <u>(444,549)</u>	\$ <u>222,944</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 22,578,264	\$ 16,033,334	\$ 865,889	\$ 11,215,206
Current discount rate (7.30%).....	\$ 18,372,432	\$ 13,046,678	\$ 704,593	\$ 9,126,061
1% increase (8.30%).....	\$ 14,833,333	\$ 10,533,484	\$ 568,867	\$ 7,368,099
Covered Payroll.....	\$ 4,300,319	\$ 3,898,859	\$ 357,369	\$ 2,887,889
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, 2019

	Nashoba Valley Technical High School District	North Chelmsford Water District	North Middlesex Regional School District	Shawsheen Valley Regional Vocational Technical School
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 3,632,610	\$ 1,048,622	\$ 12,930,464	\$ 8,565,024
Ending net pension liability/(asset).....	\$ 3,735,397	\$ 1,074,652	\$ 13,400,780	\$ 8,870,284
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 90,890	\$ 26,149	\$ 326,070	\$ 215,833
Changes of assumptions.....	257,242	74,007	922,859	610,862
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>97,183</u>	<u>116,449</u>	<u>181,918</u>	<u>122,522</u>
Total Deferred Outflows of Resources.....	\$ <u>445,315</u>	\$ <u>216,605</u>	\$ <u>1,430,847</u>	\$ <u>949,217</u>
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 8,460	\$ 2,434	\$ 30,350	\$ 20,089
Net difference between projected and actual investment earnings on pension plan investments.....	96,933	27,887	347,749	230,183
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>170,076</u>	<u>70,684</u>	<u>169,223</u>	<u>331,874</u>
Total Deferred Inflows of Resources.....	\$ <u>275,469</u>	\$ <u>101,005</u>	\$ <u>547,322</u>	\$ <u>582,146</u>
Pension Expense				
Proportionate share of plan pension expense.....	\$ 537,250	\$ 154,563	\$ 1,927,390	\$ 1,275,783
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(62,505)</u>	<u>17,184</u>	<u>(24,318)</u>	<u>(99,529)</u>
Total Employer Pension Expense.....	\$ <u>474,745</u>	\$ <u>171,747</u>	\$ <u>1,903,072</u>	\$ <u>1,176,254</u>
Contributions				
Statutory required contribution.....	\$ 302,392	\$ 67,121	\$ 1,049,643	\$ 675,105
Contribution in relation to statutory required contribution.....	<u>(302,392)</u>	<u>(67,121)</u>	<u>(1,049,643)</u>	<u>(675,105)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>
Contributions as a percentage of covered payroll.....	31.77%	10.46%	19.87%	25.62%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 79,023	\$ 39,668	\$ 364,820	\$ 199,393
June 30, 2022.....	60,952	46,119	219,414	22,833
June 30, 2023.....	26,134	33,345	274,748	133,618
June 30, 2024.....	<u>3,737</u>	<u>(3,532)</u>	<u>24,543</u>	<u>11,227</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>169,846</u>	\$ <u>115,600</u>	\$ <u>883,525</u>	\$ <u>367,071</u>
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 4,590,507	\$ 1,320,662	\$ 16,468,497	\$ 10,900,876
Current discount rate (7.30%).....	\$ 3,735,397	\$ 1,074,652	\$ 13,400,780	\$ 8,870,284
1% increase (8.30%).....	\$ 3,015,844	\$ 867,641	\$ 10,819,375	\$ 7,161,593
Covered Payroll.....	\$ 951,899	\$ 641,852	\$ 5,281,936	\$ 2,634,703
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, 2019

	South Middlesex Regional Vocational Technical School	Sudbury Water District	Tewksbury Housing Authority	Wayland Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 7,146,118	\$ 2,025,843	\$ 1,647,987	\$ 719,713
Ending net pension liability/(asset).....	\$ 7,027,195	\$ 2,571,703	\$ 1,723,517	\$ 675,758
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 170,987	\$ 62,575	\$ 41,937	\$ 16,443
Changes of assumptions.....	483,935	177,103	118,692	46,537
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	54,348	495,141	57,310	45,269
Total Deferred Outflows of Resources.....	\$ 709,270	\$ 734,819	\$ 217,939	\$ 108,249
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 15,915	\$ 5,824	\$ 3,903	\$ 1,530
Net difference between projected and actual investment earnings on pension plan investments.....	182,355	66,735	44,725	17,536
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	509,543	206,918	22,026	58,226
Total Deferred Inflows of Resources.....	\$ 707,813	\$ 279,477	\$ 70,654	\$ 77,292
Pension Expense				
Proportionate share of plan pension expense.....	\$ 1,010,698	\$ 369,880	\$ 247,888	\$ 97,192
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(167,189)	89,495	24,548	15,705
Total Employer Pension Expense.....	\$ 843,509	\$ 459,375	\$ 272,436	\$ 112,897
Contributions				
Statutory required contribution.....	\$ 559,609	\$ 131,864	\$ 133,342	\$ 51,279
Contribution in relation to statutory required contribution.....	(559,609)	(131,864)	(133,342)	(51,279)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	25.74%	12.79%	33.22%	16.80%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 50,982	\$ 171,579	\$ 78,520	\$ 31,729
June 30, 2022.....	(73,506)	74,930	33,170	4,163
June 30, 2023.....	74,686	136,509	30,077	6,267
June 30, 2024.....	(50,705)	72,324	5,518	(11,202)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 1,457	\$ 455,342	\$ 147,285	\$ 30,957
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 8,635,866	\$ 3,160,419	\$ 2,118,066	\$ 830,453
Current discount rate (7.30%).....	\$ 7,027,195	\$ 2,571,703	\$ 1,723,517	\$ 675,758
1% increase (8.30%).....	\$ 5,673,540	\$ 2,076,313	\$ 1,391,514	\$ 545,586
Covered Payroll.....	\$ 2,173,995	\$ 1,031,163	\$ 401,435	\$ 305,259
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, 2019

	Hopkinton Housing Authority	Sudbury Housing Authority	Wilmington Housing Authority	Acton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 512,474	\$ 485,854	\$ 365,221	\$ 844,128
Ending net pension liability/(asset).....	\$ 537,329	\$ 490,188	\$ 382,144	\$ 907,630
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 13,074	\$ 11,927	\$ 9,298	\$ 22,085
Changes of assumptions.....	37,004	33,757	26,317	62,505
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	17,420	41,148	18,834	67,286
Total Deferred Outflows of Resources.....	\$ 67,498	\$ 86,832	\$ 54,449	\$ 151,876
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 1,217	\$ 1,110	\$ 865	\$ 2,056
Net difference between projected and actual investment earnings on pension plan investments.....	13,944	12,720	9,917	23,553
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	28,290	13,498	1,861	100,981
Total Deferred Inflows of Resources.....	\$ 43,451	\$ 27,328	\$ 12,643	\$ 126,590
Pension Expense				
Proportionate share of plan pension expense.....	\$ 77,282	\$ 70,502	\$ 54,962	\$ 130,542
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	(1,903)	25,890	8,994	(14,727)
Total Employer Pension Expense.....	\$ 75,379	\$ 96,392	\$ 63,956	\$ 115,815
Contributions				
Statutory required contribution.....	\$ 37,224	\$ 40,316	\$ 33,927	\$ 60,962
Contribution in relation to statutory required contribution.....	(37,224)	(40,316)	(33,927)	(60,962)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	48.59%	39.57%	24.27%	15.35%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 11,386	\$ 36,595	\$ 20,352	\$ 9,444
June 30, 2022.....	205	17,090	11,005	(16,833)
June 30, 2023.....	11,371	6,841	8,321	27,376
June 30, 2024.....	1,085	(1,022)	2,128	5,299
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 24,047	\$ 59,504	\$ 41,806	\$ 25,286
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 660,335	\$ 602,402	\$ 469,625	\$ 1,115,405
Current discount rate (7.30%).....	\$ 537,329	\$ 490,188	\$ 382,144	\$ 907,630
1% increase (8.30%).....	\$ 433,823	\$ 395,763	\$ 308,531	\$ 732,792
Covered Payroll.....	\$ 76,603	\$ 101,882	\$ 139,797	\$ 397,270
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, 2019

	Burlington Housing Authority	Ayer Housing Authority	Holliston Housing Authority	Littleton Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 145,929	\$ 800,823	\$ 158,430	\$ 487,306
Ending net pension liability/(asset).....	\$ 345,712	\$ 879,177	\$ 175,571	\$ 621,840
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 8,412	\$ 21,392	\$ 4,272	\$ 15,131
Changes of assumptions.....	23,808	60,545	12,091	42,824
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	183,310	292,180	18,703	99,236
Total Deferred Outflows of Resources.....	\$ 215,530	\$ 374,117	\$ 35,066	\$ 157,191
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 783	\$ 1,991	\$ 398	\$ 1,408
Net difference between projected and actual investment earnings on pension plan investments.....	8,971	22,815	4,556	16,137
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	27,524	460,826	31,815	20,675
Total Deferred Inflows of Resources.....	\$ 37,278	\$ 485,632	\$ 36,769	\$ 38,220
Pension Expense				
Proportionate share of plan pension expense.....	\$ 49,722	\$ 126,449	\$ 25,251	\$ 89,438
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	46,273	25,164	(6,999)	23,697
Total Employer Pension Expense.....	\$ 95,995	\$ 151,613	\$ 18,252	\$ 113,135
Contributions				
Statutory required contribution.....	\$ 13,577	\$ 57,680	\$ 14,815	\$ 40,463
Contribution in relation to statutory required contribution.....	(13,577)	(57,680)	(14,815)	(40,463)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	6.53%	49.32%	18.27%	103.14%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 45,067	\$ 52,402	\$ (4,852)	\$ 45,047
June 30, 2022.....	51,050	(184,962)	(6,628)	27,672
June 30, 2023.....	50,623	13,172	7,278	26,592
June 30, 2024.....	31,512	7,873	2,499	19,660
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 178,252	\$ (111,515)	\$ (1,703)	\$ 118,971
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 424,853	\$ 1,080,439	\$ 215,763	\$ 764,192
Current discount rate (7.30%).....	\$ 345,712	\$ 879,177	\$ 175,571	\$ 621,840
1% increase (8.30%).....	\$ 279,117	\$ 709,820	\$ 141,751	\$ 502,054
Covered Payroll.....	\$ 207,760	\$ 116,945	\$ 81,096	\$ 39,232
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, 2019

	Westford Housing Authority	Shirley Water District	Tyngsborough Housing Authority	Pepperell Housing Authority
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ 561,187	\$ 406,103	\$ 526,614	\$ 187,001
Ending net pension liability/(asset).....	\$ 570,710	\$ 484,781	\$ 528,855	\$ 251,415
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ 13,887	\$ 11,796	\$ 12,868	\$ 6,117
Changes of assumptions.....	39,303	33,385	36,420	17,314
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	19,196	66,680	17,436	55,577
Total Deferred Outflows of Resources.....	\$ 72,386	\$ 111,861	\$ 66,724	\$ 79,008
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ 1,293	\$ 1,098	\$ 1,198	\$ 569
Net difference between projected and actual investment earnings on pension plan investments.....	14,810	12,580	13,724	6,524
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	7,543	38,910	20,240	6,073
Total Deferred Inflows of Resources.....	\$ 23,646	\$ 52,588	\$ 35,162	\$ 13,166
Pension Expense				
Proportionate share of plan pension expense.....	\$ 82,084	\$ 69,725	\$ 76,064	\$ 36,160
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	10,227	699	965	20,305
Total Employer Pension Expense.....	\$ 92,311	\$ 70,424	\$ 77,029	\$ 56,465
Contributions				
Statutory required contribution.....	\$ 47,397	\$ 22,677	\$ 41,548	\$ 17,159
Contribution in relation to statutory required contribution.....	(47,397)	(22,677)	(41,548)	(17,159)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	20.90%	10.46%	23.66%	16.58%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 25,363	\$ 14,363	\$ 20,161	\$ 27,190
June 30, 2022.....	15,156	14,704	9,721	15,541
June 30, 2023.....	8,517	21,343	3,608	13,210
June 30, 2024.....	(296)	8,863	(1,928)	9,901
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 48,740	\$ 59,273	\$ 31,562	\$ 65,842
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ 701,357	\$ 595,757	\$ 649,921	\$ 308,969
Current discount rate (7.30%).....	\$ 570,710	\$ 484,781	\$ 528,855	\$ 251,415
1% increase (8.30%).....	\$ 460,774	\$ 391,397	\$ 426,981	\$ 202,985
Covered Payroll.....	\$ 226,753	\$ 216,890	\$ 175,579	\$ 103,476
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, 2019

	Groton Housing Authority	Tyngsborough Water District	North Reading Housing Authority	West Groton Water
Net Pension Liability				
Beginning net pension liability/(asset).....	\$ (9,522)	\$ 463,086	\$ 159,024	\$ 39,007
Ending net pension liability/(asset).....	\$ -	\$ 481,728	\$ 214,226	\$ 36,784
Deferred Outflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 11,721	\$ 5,213	\$ 895
Changes of assumptions.....	\$ -	\$ 33,175	\$ 14,753	\$ 2,533
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 17,077	\$ 27,904	\$ 51,883	\$ 11,782
Total Deferred Outflows of Resources.....	\$ 17,077	\$ 72,800	\$ 71,849	\$ 15,210
Deferred Inflows of Resources				
Differences between expected and actual experience.....	\$ -	\$ 1,091	\$ 485	\$ 83
Net difference between projected and actual investment earnings on pension plan investments.....	\$ -	\$ 12,501	\$ 5,559	\$ 955
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 10,287	\$ 12,123	\$ 3,204	\$ 6,560
Total Deferred Inflows of Resources.....	\$ 10,287	\$ 25,715	\$ 9,248	\$ 7,598
Pension Expense				
Proportionate share of plan pension expense.....	\$ -	\$ 69,285	\$ 30,811	\$ 5,291
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	\$ 1,192	\$ 6,883	\$ 20,608	\$ 4,688
Total Employer Pension Expense.....	\$ 1,192	\$ 76,168	\$ 51,419	\$ 9,979
Contributions				
Statutory required contribution.....	\$ 2,809	\$ 37,652	\$ 16,668	\$ 2,545
Contribution in relation to statutory required contribution.....	\$ (2,809)	\$ (37,652)	\$ (16,668)	\$ (2,545)
Contribution deficiency/(excess).....	\$ -	\$ -	\$ -	\$ -
Contributions as a percentage of covered payroll.....	0.00%	18.36%	18.39%	2.05%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense				
June 30, 2021.....	\$ 292	\$ 17,861	\$ 26,004	\$ 2,580
June 30, 2022.....	\$ (27)	\$ 11,502	\$ 13,469	\$ 3,523
June 30, 2023.....	\$ 4,259	\$ 16,545	\$ 14,224	\$ 2,138
June 30, 2024.....	\$ 2,266	\$ 1,177	\$ 8,904	\$ (629)
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ 6,790	\$ 47,085	\$ 62,601	\$ 7,612
Discount Rate Sensitivity				
1% decrease (6.30%).....	\$ -	\$ 592,006	\$ 263,267	\$ 45,205
Current discount rate (7.30%).....	\$ -	\$ 481,728	\$ 214,226	\$ 36,784
1% increase (8.30%).....	\$ -	\$ 388,932	\$ 172,959	\$ 29,698
Covered Payroll.....	\$ -	\$ 205,062	\$ 90,640	\$ 124,349
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, 2019

	Ayer-Shirley Regional School District	Totals
Net Pension Liability		
Beginning net pension liability/(asset).....	\$ 5,157,881	\$ 1,559,466,457
Ending net pension liability/(asset).....	\$ 4,713,693	\$ 1,600,056,015
Deferred Outflows of Resources		
Differences between expected and actual experience.....	\$ 114,694	\$ 38,932,789
Changes of assumptions.....	324,614	110,189,599
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>434,072</u>	<u>43,163,151</u>
Total Deferred Outflows of Resources.....	\$ <u>873,380</u>	\$ <u>192,285,539</u>
Deferred Inflows of Resources		
Differences between expected and actual experience.....	\$ 10,675	\$ 3,623,756
Net difference between projected and actual investment earnings on pension plan investments.....	122,320	41,521,333
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>688,041</u>	<u>43,163,151</u>
Total Deferred Inflows of Resources.....	\$ <u>821,036</u>	\$ <u>88,308,240</u>
Pension Expense		
Proportionate share of plan pension expense.....	\$ 677,954	\$ 230,481,895
Net amortization of deferred amounts from changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>(103,306)</u>	<u>-</u>
Total Employer Pension Expense.....	\$ <u>574,648</u>	\$ <u>230,481,895</u>
Contributions		
Statutory required contribution.....	\$ 467,540	\$ 127,151,838
Contribution in relation to statutory required contribution.....	<u>(467,540)</u>	<u>(129,685,754)</u>
Contribution deficiency/(excess).....	\$ <u>-</u>	\$ <u>(2,533,916)</u>
Contributions as a percentage of covered payroll.....	13.26%	26.35%
Deferred Outflows/(Inflows) Recognized in Future Pension Expense		
June 30, 2021.....	\$ 3,222	\$ 49,253,729
June 30, 2022.....	25,570	25,922,414
June 30, 2023.....	104,340	27,854,810
June 30, 2024.....	<u>(80,788)</u>	<u>946,346</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	\$ <u>52,344</u>	\$ <u>103,977,299</u>
Discount Rate Sensitivity		
1% decrease (6.30%).....	\$ 5,792,755	\$ 1,966,342,109
Current discount rate (7.30%).....	\$ 4,713,693	\$ 1,600,056,015
1% increase (8.30%).....	\$ 3,805,690	\$ 1,291,835,664
Covered Payroll.....	\$ 3,526,825	\$ 492,109,775
See notes to schedule of employer allocations and schedule of pension amounts by employer.		(Concluded)

NOTE A – Schedule of Employer Allocations

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

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

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

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

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

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

Middlesex County Retirement System

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**Audit of Specific Elements, Accounts and Items
of Financial Statements**

NOTE B – 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.

The following assumption changes were reflected in the January 1, 2020 actuarial valuation.

Changes in Assumptions

- The net investment return assumption was lowered from 7.50% to 7.30%.

Changes in Plan Provisions

- As permitted by Section 19 of Chapter 188 of the Acts of 2010, the Cost of Living Adjustment base was increased from \$14,000 to \$16,000 as of July 1, 2019.



COMMONWEALTH OF MASSACHUSETTS

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