



**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

TABLE OF CONTENTS

Financial Section	1
Independent Auditor's Report	3
Management's Discussion and Analysis.....	6
Financial Statements.....	9
Statement of Fiduciary Net Position	9
Statement of Changes in Fiduciary Net Position.....	10
Notes to Financial Statements.....	11
Required Supplementary Information	21
Schedule of Changes in the Net Pension Liability and Related Ratios.....	22
Schedule of Contributions	24
Schedule of Investment Returns	25
Notes to Required Supplementary Information	26
Audit of Specific Elements, Accounts and Items of Financial Statements	27
Independent Auditor's Report	29
Pension Plan Schedules	31
Schedule of Employer Allocations	31
Schedule of Pension Amounts by Employer	33
Notes to Schedule of Employer Allocations and Schedule of Pension Amounts by Employer.....	52

Financial Section

This page left intentionally blank.

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 "Bowers & 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

	2022	2021
Additions:		
Contributions:		
Member contributions..... \$	54,257,364	\$ 51,747,946
Employer contributions.....	156,421,867	147,955,483
Other contributions.....	18,734,375	14,791,325
Total contributions.....	229,413,606	214,494,754
Net investment income (loss):		
Total investment income (loss).....	(230,563,506)	349,671,539
Less, investment expenses.....	(9,685,400)	(9,428,015)
Net investment income (loss).....	(240,248,906)	340,243,524
Total additions.....	(10,835,300)	554,738,278
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.....	174,374	320,288
Total deductions.....	215,168,381	201,105,609
Net increase (decrease) in fiduciary net position....	(226,003,681)	353,632,669
Fiduciary net position at beginning of year.....	2,109,770,999	1,756,138,330
Fiduciary net position at end of year..... \$	1,883,767,318	\$ 2,109,770,999

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..... 984

Total investments..... 1,842,477,278

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..... 17,547

Total receivables..... 5,482,503

Interest and dividends..... 48,545

Capital assets, net of accumulated depreciation..... 4,044,658

Total Assets..... 1,883,921,443

Liabilities

Accounts payable..... 127,569

Other liabilities..... 26,556

Total Liabilities..... 154,125

Net Position Restricted for Pensions..... \$ 1,883,767,318

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.....	80,691

Total contributions..... 229,413,606

Net investment income (loss):

Investment income (loss).....	(230,563,506)
Less: investment expense.....	<u>(9,685,400)</u>

Net investment income (loss)..... (240,248,906)

Total additions..... (10,835,300)

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..... 215,168,381

Net increase (decrease) in fiduciary net position..... (226,003,681)

Fiduciary net position at beginning of year..... 2,109,770,999

Fiduciary net position at end of year..... \$ 1,883,767,318

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.....	984
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:

		Fair Value Measurements Using		
Investment Type	12/31/2022	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.

This page intentionally left blank.

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	-
(161,259,804)	(168,486,003)	(181,769,445)	(184,028,124)	(193,970,504)
111,970,254	256,078,053	121,647,179	163,267,055	130,329,507
2,797,535,970	2,909,506,224	3,165,584,277	3,287,231,456	3,450,498,511
<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)
(318,812)	(318,812)	(321,386)	(320,288)	(174,374)
(28,311,454)	215,488,497	190,610,068	353,632,669	(226,003,681)
1,378,351,219	1,350,039,765	1,565,528,262	1,756,138,330	2,109,770,999
<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

This page left intentionally blank

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.

A handwritten signature in black ink, appearing to read "Bowers & Sullivan LLC", is written over a horizontal line.

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.....	<u>\$ 602,070</u>	<u>\$ 6,133,483</u>	<u>\$ 3,145,509</u>	<u>\$ 7,763,829</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 107,000</u>	<u>\$ 1,473,803</u>	<u>\$ 292,260</u>	<u>\$ 1,140,018</u>
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	226,168	155,921	(159,982)
Total Employer Pension Expense.....	<u>\$ 298,650</u>	<u>\$ 4,303,661</u>	<u>\$ 2,355,321</u>	<u>\$ 5,891,459</u>
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).....	<u>\$ -</u>	<u>\$ (45,095)</u>	<u>\$ (300,000)</u>	<u>\$ -</u>
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.....	<u>\$ 495,070</u>	<u>\$ 4,659,680</u>	<u>\$ 2,853,249</u>	<u>\$ 6,623,811</u>
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).....	\$ 136,488,741	\$ 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.....	<u>\$ 6,053,921</u>	<u>\$ 9,036,217</u>	<u>\$ 9,210,653</u>	<u>\$ 4,910,548</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 2,569,699</u>	<u>\$ 2,566,478</u>	<u>\$ 394,803</u>	<u>\$ 128,696</u>
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.....	<u>\$ 2,839,664</u>	<u>\$ 4,153,806</u>	<u>\$ 8,012,883</u>	<u>\$ 3,761,126</u>
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).....	<u>\$ -</u>	<u>\$ (54,866)</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ 3,484,222</u>	<u>\$ 6,469,739</u>	<u>\$ 8,815,850</u>	<u>\$ 4,781,852</u>
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.....	<u>\$ 7,999,372</u>	<u>\$ 6,083,893</u>	<u>\$ 2,047,357</u>	<u>\$ 1,989,727</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 106,404</u>	<u>\$ 1,331,593</u>	<u>\$ 104,629</u>	<u>\$ 240,975</u>
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.....	<u>\$ 4,868,741</u>	<u>\$ 5,190,071</u>	<u>\$ 1,967,210</u>	<u>\$ 1,225,608</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ (773)</u>	<u>\$ -</u>
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.....	<u>\$ 7,892,968</u>	<u>\$ 4,752,300</u>	<u>\$ 1,942,728</u>	<u>\$ 1,748,752</u>
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.....	<u>\$ 1,557,274</u>	<u>\$ 2,333,067</u>	<u>\$ 7,240,420</u>	<u>\$ 16,972,086</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 526,796</u>	<u>\$ 263,882</u>	<u>\$ 2,033,590</u>	<u>\$ 7,852,508</u>
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.....	<u>\$ 1,099,082</u>	<u>\$ 1,707,157</u>	<u>\$ 6,120,660</u>	<u>\$ 11,180,403</u>
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).....	<u>\$ -</u>	<u>\$ (3,416)</u>	<u>\$ -</u>	<u>\$ (4,831)</u>
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.....	<u>\$ 1,030,478</u>	<u>\$ 2,069,185</u>	<u>\$ 5,206,830</u>	<u>\$ 9,119,578</u>
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.....	<u>\$ 2,118,577</u>	<u>\$ 3,888,014</u>	<u>\$ 7,541,927</u>	<u>\$ 12,996,578</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 1,465,660</u>	<u>\$ -</u>	<u>\$ 2,300,846</u>	<u>\$ 2,660,667</u>
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.....	<u>(152,213)</u>	<u>503,300</u>	<u>(583,558)</u>	<u>1,006,258</u>
Total Employer Pension Expense.....	<u>\$ 635,142</u>	<u>\$ 3,369,701</u>	<u>\$ 5,666,034</u>	<u>\$ 7,788,133</u>
Contributions				
Statutory required contribution.....	\$ 991,340	\$ 2,617,413	\$ 5,728,625	\$ 6,263,082
Contribution in relation to statutory required contribution.....	<u>(995,268)</u>	<u>(2,617,413)</u>	<u>(5,728,625)</u>	<u>(6,263,082)</u>
Contribution deficiency/(excess).....	<u>\$ (3,928)</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>677,872</u>	<u>1,419,154</u>	<u>3,080,811</u>	<u>4,546,282</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 652,917</u>	<u>\$ 3,888,014</u>	<u>\$ 5,241,081</u>	<u>\$ 10,335,911</u>
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	2,637,394	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.....	<u>\$ 9,145,235</u>	<u>\$ 10,831,123</u>	<u>\$ 4,817,829</u>	<u>\$ 551,539</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 1,520,935</u>	<u>\$ 1,151,190</u>	<u>\$ 779,514</u>	<u>\$ 64,378</u>
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.....	<u>(182,103)</u>	<u>(197,170)</u>	<u>257,532</u>	<u>(26,785)</u>
Total Employer Pension Expense.....	<u>\$ 7,505,251</u>	<u>\$ 9,541,166</u>	<u>\$ 3,671,773</u>	<u>\$ 421,886</u>
Contributions				
Statutory required contribution.....	\$ 6,288,908	\$ 8,322,908	\$ 3,320,479	\$ 288,240
Contribution in relation to statutory required contribution.....	<u>(6,288,908)</u>	<u>(9,828,234)</u>	<u>(3,320,479)</u>	<u>(288,240)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ (1,505,326)</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>3,085,137</u>	<u>4,033,717</u>	<u>1,810,532</u>	<u>213,067</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 7,624,300</u>	<u>\$ 9,679,933</u>	<u>\$ 4,038,315</u>	<u>\$ 487,161</u>
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 Chelmsford 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.....	<u>\$ 216,221</u>	<u>\$ 588,142</u>	<u>\$ 133,878</u>	<u>\$ 260,008</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 333,536</u>	<u>\$ 278,749</u>	<u>\$ 87,606</u>	<u>\$ 81,841</u>
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.....	<u>(113,215)</u>	<u>(39,195)</u>	<u>880</u>	<u>32,399</u>
Total Employer Pension Expense.....	<u>\$ 91,594</u>	<u>\$ 353,490</u>	<u>\$ 38,203</u>	<u>\$ 120,212</u>
Contributions				
Statutory required contribution.....	\$ 182,577	\$ 270,657	\$ 40,049	\$ 62,459
Contribution in relation to statutory required contribution.....	<u>(182,577)</u>	<u>(270,657)</u>	<u>(40,049)</u>	<u>(62,459)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>57,899</u>	<u>108,976</u>	<u>40,355</u>	<u>80,870</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ (117,315)</u>	<u>\$ 309,393</u>	<u>\$ 46,272</u>	<u>\$ 178,167</u>
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 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).....	\$ 17,260,795	\$ 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.....	165,092	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	164,497
June 30, 2026.....	37,669	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	\$ (5,802)
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	66,572
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.....	<u>\$ 87,209</u>	<u>\$ 86,554</u>	<u>\$ 40,032</u>	<u>\$ 174,213</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 34,752</u>	<u>\$ 37,017</u>	<u>\$ 86,313</u>	<u>\$ 30,654</u>
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.....	<u>\$ 62,715</u>	<u>\$ 54,922</u>	<u>\$ 999</u>	<u>\$ 121,549</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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	62,578
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 52,457</u>	<u>\$ 49,537</u>	<u>\$ (46,281)</u>	<u>\$ 143,559</u>
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.....	<u>\$ 3,412</u>	<u>\$ 148,214</u>	<u>\$ 55,178</u>	<u>\$ 94,760</u>
Deferred Inflows of Resources				
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ -</u>	<u>\$ 16,813</u>	<u>\$ 98,346</u>	<u>\$ 40,870</u>
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.....	<u>\$ 4,832</u>	<u>\$ 84,622</u>	<u>\$ (4,981)</u>	<u>\$ 16,729</u>
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).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>	<u>\$ -</u>
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.....	<u>\$ 3,412</u>	<u>\$ 131,401</u>	<u>\$ (43,168)</u>	<u>\$ 53,890</u>
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	\$ 62,656	\$ 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
<u>Net Pension Liability</u>			
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
<u>Deferred Outflows of Resources</u>			
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.....	<u>1,564,488</u>	<u>287,619</u>	<u>64,007,005</u>
Total Deferred Outflows of Resources.....	<u>\$ 2,062,933</u>	<u>\$ 348,787</u>	<u>\$ 242,217,199</u>
<u>Deferred Inflows of Resources</u>			
Changes in proportion and differences between employer contributions and proportionate share of contributions.....	<u>\$ 1,081,219</u>	<u>\$ 5,226</u>	<u>\$ 64,007,005</u>
<u>Pension Expense</u>			
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.....	<u>70,975</u>	<u>86,980</u>	<u>-</u>
Total Employer Pension Expense.....	<u>\$ 564,988</u>	<u>\$ 147,602</u>	<u>\$ 177,084,875</u>
<u>Contributions</u>			
Statutory required contribution.....	\$ 545,398	\$ -	\$ 153,677,331
Contribution in relation to statutory required contribution.....	<u>(545,398)</u>	<u>-</u>	<u>(156,335,119)</u>
Contribution deficiency/(excess).....	<u>\$ -</u>	<u>\$ -</u>	<u>\$ (2,657,788)</u>
Contributions as a percentage of covered payroll.....	12.90%	N/A	28.88%
<u>Deferred Outflows/(Inflows) Recognized in</u>			
<u>Future Pension Expense</u>			
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.....	<u>610,222</u>	<u>45,722</u>	<u>78,334,907</u>
Total Deferred Outflows/(Inflows) Recognized in Future Pension Expense.....	<u>\$ 981,714</u>	<u>\$ 343,561</u>	<u>\$ 178,210,194</u>
<u>Discount Rate Sensitivity</u>			
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.