

WORCESTER REGIONAL RETIREMENT SYSTEM

**INDEPENDENT AUDITORS' REPORT ON
FINANCIAL STATEMENTS AND
REQUIRED SUPPLEMENTARY INFORMATION**

FOR THE YEAR ENDED DECEMBER 31, 2017

WORCESTER REGIONAL RETIREMENT SYSTEM

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Independent Auditors' Report

Independent Auditors' Report

To the Honorable Retirement Board
Worcester Regional Retirement System
Auburn, Massachusetts 01501

Report on the Financial Statements

We have audited the accompanying financial statements of the Worcester Regional Retirement System (the System), as of and for the year ended December 31, 2017, and the related notes to the financial statements, as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditors' Responsibility

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

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the fiduciary net position of the System as of December 31, 2017, and the respective change in fiduciary net position for the year then ended in accordance with accounting principles generally accepted in the United States of America.

Other Matters

Required Supplementary Information

Accounting principles generally accepted in the United States of America require that the management's discussion and analysis (located on pages 4 through 8), schedule of changes in employers' net pension liability and related ratios, schedule of employer contributions and schedule of investment returns (located on pages 21 through 23) be presented to supplement the financial statements. Such information, although not a part of the financial statements, is required by the Governmental Accounting Standards Board who considers it to be an essential part of financial reporting for placing the financial statements in an appropriate operational, economic, or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States of America, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the financial statements, and other knowledge we obtained during our audit of the financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

Other Reporting Required by Government Auditing Standards

In accordance with *Government Auditing Standards*, we have also issued our report dated September 20, 2018, on our consideration of the System's internal control over financial reporting and on our tests of its compliance with certain provisions of laws, regulations, contracts, and 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 the System'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 System's internal control over financial reporting and compliance.

CliftonLarsonAllen LLP

Boston, Massachusetts
September 20, 2018

Management's Discussion and Analysis

WORCESTER REGIONAL RETIREMENT SYSTEM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2017

As management of the Worcester Regional Retirement System (System), we offer readers of these financial statements this narrative overview and analysis of the System's financial activities for the year ended December 31, 2017.

The management's discussion and analysis (MD&A) is presented in the following sections:

1. Financial Highlights
2. Overview of the Financial Statements
3. Financial Statement Analysis

Please refer to the audited *Financial Statements* when reading the MD&A.

Financial Highlights

Fiduciary net position increased by \$99,408,475 or 16.4%, when compared to the prior year's fiduciary net position. Fiduciary net position is the residual of the System's assets in excess of the System's liabilities, as reported in the Statement of Fiduciary Net Position, as of the statement date. The System's assets are held in trust to meet future benefit payments.

Overview of the Financial Statements

The financial statements are comprised of a Statement of Fiduciary Net Position, Statement of Changes in Fiduciary Net Position, Notes to Financial Statements and Required Supplementary Information.

The **statement of fiduciary net position** presents information on the System's assets and liabilities and the resulting net position restricted for pensions. This is calculated using the following formula: Assets - Liabilities = Net Position restricted for pensions. This statement reflects the System's investments at fair value, as well as cash, receivables and other assets and liabilities. The Statement of Fiduciary Net Position reports the financial position of the System at December 31, 2017. Over time, the increase or decrease in fiduciary net position serves as a useful indicator of the System's financial health.

The **statement of changes in fiduciary net position** presents information showing how the System's fiduciary net position changed during the year ended December 31, 2017. It reflects contributions by its individual members and participating employers along with deductions for retirement benefits, refunds, withdrawals, and administrative expenses. Investment income during the period is also presented showing income from investing activities.

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

The **required supplementary information** includes schedules of changes in employers' net pension liability and related ratios, schedule of employer contributions and schedule of investment returns.

Financial Statement Analysis

The System's total assets as of December 31, 2017 were \$716,278,338 and were comprised of cash and cash equivalents, investments and receivables.

Total liabilities as of December 31, 2017 were \$10,285,051 and represent amounts owed for accounts payable and reimbursements and transfers to other systems.

WORCESTER REGIONAL RETIREMENT SYSTEM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2017

The following tables present current and prior year data on the System's financial statements.

Fiduciary Net Position

As noted earlier, fiduciary net position may serve over time as a useful indicator of the System's financial position. The System's assets exceeded liabilities by \$705,993,287 at the close of the year and are summarized as follows:

	2017	2016
Assets		
Cash and cash equivalents.....	\$ 2,919,956	\$ 4,322,402
Investments.....	709,077,200	607,282,514
Receivables.....	4,281,182	6,087,919
Total assets.....	716,278,338	617,692,835
Liabilities		
Accounts payable.....	51,515	23,426
Reimbursements and transfers to other systems.....	10,233,536	11,084,597
Total liabilities.....	10,285,051	11,108,023
Net Position		
Net position restricted for pensions.....	\$ 705,993,287	\$ 606,584,812

WORCESTER REGIONAL RETIREMENT SYSTEM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2017

Changes in Fiduciary Net Position

For the year ended December 31, 2017, the System's total fiduciary net position increased by \$99,408,475. In the prior year, fiduciary net position increased by \$36,952,178. These amounts are summarized as follows:

	<u>2017</u>	<u>2016</u>
Additions		
<i>Contributions:</i>		
Employers.....	\$ 50,599,326	\$ 48,574,831
Members.....	31,592,837	29,032,767
<i>Net investment income:</i>		
Net realized and unrealized gains (loss).....	88,480,180	27,004,748
Interest and dividends.....	18,105,902	16,716,744
Less: management fees.....	(3,463,012)	(3,212,206)
Other.....	2,416,580	3,065,252
	<u>187,731,813</u>	<u>121,182,136</u>
Deductions		
Retirement benefits and refunds.....	77,717,794	72,799,275
Reimbursements and transfers to other systems.....	9,460,035	10,260,499
Administration.....	1,145,509	1,170,184
	<u>88,323,338</u>	<u>84,229,958</u>
Net increase (decrease) in net position.....	99,408,475	36,952,178
Net position restricted for pensions - beginning of year.....	<u>606,584,812</u>	<u>569,632,634</u>
Net position restricted for pensions - end of year.....	<u>\$ 705,993,287</u>	<u>\$ 606,584,812</u>

Additions to Fiduciary Net Position

Total additions to net position for 2017 were \$187,731,813. Contributions increased by approximately \$4,585,000 in 2017 when compared to the prior year. The System had net investment income of approximately \$103,123,000 in 2017 compared to income of approximately \$40,509,000 in 2016 as a result of improved market performance.

Deductions from Fiduciary Net Position

Total deductions from net position for 2017 were \$88,323,338. Retirement benefits and refunds increased by approximately \$4,919,000 in 2017 when compared to the prior year as a result of an increased number of retirees and the annual 3% COLA. Other deductions decreased by approximately \$825,000 in 2017 when compared to the prior year.

WORCESTER REGIONAL RETIREMENT SYSTEM
MANAGEMENT'S DISCUSSION AND ANALYSIS
DECEMBER 31, 2017

Requests for Information

This financial report is designed to provide the Board, our membership, taxpayers, investors, and creditors with a general overview of the System's financial results and to demonstrate the System's accountability for the funding it receives. If you have any questions about this report or need additional financial information, contact the Chairman/Chief Executive Officer at 23 Midstate Drive, Suite 106, Auburn, Massachusetts 01501.

Financial Statements

WORCESTER REGIONAL RETIREMENT SYSTEM
STATEMENT OF FIDUCIARY NET POSITION
DECEMBER 31, 2017

ASSETS

Cash and cash equivalents.....	\$	2,919,956
Investments:		
External investment pools.....		705,763,910
Real estate.....		449,652
Private equity.....		2,863,638
Total investments.....		709,077,200
Receivables:		
Employer contributions.....		336,635
Member contributions.....		1,875,782
Reimbursements and transfers from other systems.....		2,068,765
Total receivables.....		4,281,182
Total assets.....		716,278,338
LIABILITIES		
Accounts payable.....		51,515
Reimbursements and transfers to other systems.....		10,233,536
Total liabilities.....		10,285,051
NET POSITION RESTRICTED FOR PENSIONS.....	\$	705,993,287

The accompanying notes are an integral part of the financial statements.

WORCESTER REGIONAL RETIREMENT SYSTEM
STATEMENT OF CHANGES IN FIDUCIARY NET POSITION
FOR THE YEAR ENDED DECEMBER 31, 2017

ADDITIONS

Contributions:

Employers.....	\$	50,599,326
Members.....		31,592,837
		<u>82,192,163</u>

Net investment income:

Net realized and unrealized gains.....		88,480,180
Interest and dividends		18,105,902
Less: management fees.....		(3,463,012)
		<u>103,123,070</u>

Other.....		2,416,580
		<u>187,731,813</u>

DEDUCTIONS

Retirement benefits and refunds.....		77,717,794
Reimbursements and transfers to other systems.....		9,460,035
Administration.....		1,145,509
		<u>88,323,338</u>

Total deductions.....		99,408,475
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NET POSITION RESTRICTED FOR PENSIONS

Beginning of year.....		606,584,812
End of year.....	\$	<u>705,993,287</u>

The accompanying notes are an integral part of the financial statements.

WORCESTER REGIONAL RETIREMENT SYSTEM
NOTES TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2017

NOTE 1 - SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

A. General

The financial statements 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 standard-setting body for establishing governmental accounting and financial reporting principles. The significant accounting policies are described herein.

B. Reporting Entity

The Worcester Regional Retirement System (System) was established to provide retirement benefits to eligible employees of its member employers.

C. Measurement Focus and Basis of Accounting

The System's financial statements are presented using the flow of economic resources measurement focus and use the accrual basis of accounting.

D. Cash and Investments

Cash is 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 reported at fair value. Fair value is based on quotations from a national securities exchange except for pooled funds, alternative investments and real estate investments, for which fair value is estimated as follows:

Pooled Funds

The fair value of shares in managed investment pools is based on unit value reported by the funds.

Private Equity and Real Estate

The fair values of these types of investments have been determined by the third party investment managers using the Net Asset Value (NAV) per share (or its equivalent) of the System's ownership interest in partner's capital.

E. Basis of Investment Transactions

Purchases and sales of investments are recorded on the trade date. Transactions remaining unsettled as of year-end are recorded as payables for securities purchased and as a receivable for securities sold.

F. Revenue Recognition

Contributions are recognized as additions in the period when they become due pursuant to formal commitments, statutory or contractual requirements. Investment income is recognized when earned.

G. Benefits and Refunds

Benefits and refunds are recognized as deductions when due and payable in accordance with the terms of the System.

WORCESTER REGIONAL RETIREMENT SYSTEM
NOTES TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2017

H. Administrative Expenses

Administrative expenses are financed by contributions to the System.

I. Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure for contingent assets and liabilities at the date of the financial statements and the reported amounts of the additions and deductions during the fiscal year. Actual results could vary from estimates that were used.

NOTE 2 - PLAN DESCRIPTION

A. General

The System is a cost-sharing multiple-employer public employee retirement system established in 1937, under Massachusetts General Laws (MGL), Chapter 32, and is regulated by the Massachusetts Public Employee Retirement Administration Commission (PERAC). The System is a defined benefit pension plan that covers eligible employees of its member employers.

Membership in the System is mandatory immediately upon the commencement of employment for all permanent full-time employees working at least 20 hours weekly, except for school teachers and school administrators who participate in the Massachusetts Teachers' Retirement System.

Membership in the System as of December 31, 2017 was as follows:

Inactive members (or beneficiaries) currently receiving benefits	3,723
Inactive members entitled to, but not yet receiving benefits	1,653
Active members	<u>7,601</u>
Total members	<u><u>12,977</u></u>
Number of member employers	<u><u>97</u></u>

The System is governed by a five-member board comprised of the Chairman/Chief Executive Officer, who serves ex-officio and is appointed by the other members of the board; two members who are elected by the participants in or retired from the services of the System; a fourth member appointed by the member employers; and a fifth member appointed by the other members of the board.

B. Significant Plan Provisions and Requirements

Benefit provisions and state law establishes contribution requirements of the System. Members of the System become vested after 10 years of creditable service. Normal retirement occurs at age 65 (age 67 if hired on or after April 2, 2012), except for certain public safety employees and other special situations.

WORCESTER REGIONAL RETIREMENT SYSTEM
NOTES TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2017

B. Significant Plan Provisions and Requirements (continued)

For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 65, this percentage is 2.5%, which is reduced for individuals who retire prior to age 65 to reflect the longer pay out period. A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on or after April 2, 2012, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by (1) the number of years and full months of creditable service at the time of retirement and (2) a percentage based on age at retirement in accordance with a schedule provided by state law. Assuming normal retirement at age 67, this percentage is 2.5%. A member's final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

Employees hired before April 2, 2012 may elect early retirement after 20 years of service or at any time after attaining age 55 with 10 years of eligible service. Plan members who become permanently and totally disabled may be eligible to receive a disability retirement allowance. The amount of benefits to be received depends on several factors, including the member's age, compensation, veteran status, years of service and whether or not the disability is work-related. In addition, certain death benefits exist for beneficiaries of employees who die in active service.

Under MGL, c.32 Section 3(8)(c), members leaving a member employer to work for other Massachusetts governmental units requires the System transfer their accumulated account balances and creditable service to the retirement system of their new employer. Other such retirement systems are in turn required to make comparable transfers to the System for employees coming to work at a member employer of the System. Per statute, the PERAC actuary shall consider length of service as well as acceptance of military service credit and salary cap provisions if applicable in calculating the liability.

NOTE 3 - DEPOSITS AND INVESTMENTS

Investment Policy

Deposits and investments made by the System are governed by Chapter 32 of the MGL. The System has the ability to invest in equity securities, corporate bonds, annuities and other specified investments in accordance with state laws and regulations.

The System invests in the Pension Reserve Investment Trust (PRIT). PRIT meets the criteria of an external investment pool and operates in accordance with applicable state laws and regulations. The Treasurer of the Commonwealth serves as Trustee and provides regulatory oversight. The reported value of the pool is the same as the fair value of the System's position in pool shares.

WORCESTER REGIONAL RETIREMENT SYSTEM
NOTES TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2017

The System's asset allocation policies are established by PRIT. System 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 System. The following was the asset allocation policy as of December 31, 2017:

Asset Class	Target
Global Equity	40%
Fixed Income	22%
Private Equity	11%
Real Estate	10%
Timber/Natural Resources	4%
Hedge Funds	13%

Rate of Return

For the year ended December 31, 2017, the annual money-weighted rate of return on pension plan investments, net of pension plan investment expense, was 16.71%. The money-weighted rate of return expresses investment performance, net of investment expense, adjusted for the changing amounts actually invested.

Deposits - Custodial Credit Risk

Custodial credit risk for deposits is the risk that, in the event of a bank failure, the System's deposits may not be recovered. The System's policy for custodial credit risk of deposits is to rely on FDIC and DIF insurance coverage. As of December 31, 2017, the System's bank balance of \$4,712,497 was not exposed to custodial credit risk.

Investments Summary

The System's investments at December 31, 2017 are presented below. All investments are presented by investment type, with debt securities presented by maturity.

Investment Type	Fair Value	Investment Maturities (in Years) Less Than 1
<u>External Investment Pools:</u>		
Pension Reserve Investment Trust.....	\$ 705,763,910	\$ <u>705,763,910</u>
<u>Other Investments:</u>		
Real estate.....	449,652	
Private equity	<u>2,863,638</u>	
Total other investments.....	<u>3,313,290</u>	
Total investments.....	\$ <u>709,077,200</u>	

WORCESTER REGIONAL RETIREMENT SYSTEM
 NOTES TO FINANCIAL STATEMENTS
 FOR THE YEAR ENDED DECEMBER 31, 2017

Investments - Interest Rate Risk of Debt Securities

Interest rate risk for debt securities is the risk that changes in interest rates of debt securities will adversely affect the fair value of an investment. The System's policy for interest rate risk of debt securities is to use diversification to minimize the exposure to interest rate risks in the aggregate investment portfolio.

Investments - Custodial Credit Risk

Custodial credit risk for investments is the risk that, in the event of the failure of the counterparty, the System will not be able to recover the value of its investments or collateral securities that are in the possession of an outside party. The System's policy for custodial credit risk of investments intends that all investments are either insured and/or registered in the name of the System. As of December 31, 2017, the System was not exposed to custodial credit risk.

Investments - Credit Risk of Debt Securities

Credit risk for debt securities is the risk that an issuer or other counterparty to a debt security will not fulfill its obligations. The System's policy for credit risk of debt securities is to use diversification to minimize the exposure to credit risks in the aggregate investment portfolio. As of December 31, 2017, the System's debt security investments were in external investment pools unrated by national credit rating organizations.

Deposits and Investments - Foreign Currency Risk

Foreign currency risk is the risk that fluctuations in exchange rates will adversely affect the fair value of an investment or a deposit. The System's policy for foreign currency risk is to diversify the foreign countries and currencies within its international investment portfolio. As of December 31, 2017, the System was not exposed to foreign currency risk.

Investments - Concentration of Credit Risk

Concentration of credit risk is the risk of loss attributed to the magnitude of the System's investment in a single issuer. The System's policy for concentration of credit risk is to use extensive diversification to minimize exposure to company and industry specific risks in the aggregate investment portfolio. As of December 31, 2017, the System was not exposed to concentration of credit risk.

Investments - Fair Value

The System categorizes its fair value measurements within the fair value hierarchy established by generally accepted accounting principles. The hierarchy is based on the valuation inputs used to measure the fair value of the asset. Level 1 inputs are quoted market prices in active markets for identical assets; Level 2 inputs are significant other observable inputs; Level 3 inputs are significant unobservable inputs.

As of December 31, 2017, all of the System's investments were measured at the Net Asset Value (NAV) or its equivalent as presented in the following table:

	Total Amount	Unfunded Commitments	Redemption Frequency	Redemption Notice Period
External Investment Pool (PRIT) (1).....	\$ 705,763,910	\$ -	Monthly ⁽¹⁾	24 Hours ⁽¹⁾
Private Equity (2).....	2,863,638	-	N/A ⁽²⁾	N/A ⁽²⁾
Real Estate (3).....	449,652	-	N/A ⁽³⁾	N/A ⁽³⁾
Total Investments Measured at the NAV..	<u>\$ 709,077,200</u>			

WORCESTER REGIONAL RETIREMENT SYSTEM
NOTES TO FINANCIAL STATEMENTS
FOR THE YEAR ENDED DECEMBER 31, 2017

- (1) *External Investment Pool (PRIT)* -The System is a participating retirement system in the PRIT fund. The system owns units, or shared in the PRIT fund, which is a pooled investment trust. The fair values of the investments in this type have been determined using the NAV per share (or its equivalent) of the System's ownership in the pool. Investments in the fund can be redeemed on a monthly basis with written notice submitted by the first business day of the month of redemption.
- (2) *Private equity* - This investment type includes investments in 4 private equity funds that invest primarily in private domestic and international companies of diversified industries. The fair value measurements of this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. The investments can never be redeemed from the funds. Distributions from each fund will be received as the underlying investments of the funds are liquidated. It is expected that the underlying assets of the funds will be liquidated over the next 1 to 5 years.
- (3) *Real estate* - This investment type includes investments in 3 funds that invest in real estate. The fair value measurements of this type have been determined using the NAV per share (or its equivalent) of the System's ownership interest in partners' capital. The investments can never be redeemed from the funds. Distributions from each fund will be received as the underlying investments of the funds are liquidated. It is expected that the underlying assets of the funds will be liquidated over the next 1 to 5 years

NOTE 4 - FUNDING POLICY

Chapter 32 of MGL governs the contributions of plan members and member employers. Depending on their employment date, active System members must contribute anywhere between 5%-9% of their gross regular compensation. Members hired after December 31, 1978 must contribute an additional 2% of regular compensation in excess of \$30,000. Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%. These deductions earn interest at a rate determined by PERAC that vests based upon years of service. Employers are required to pay into the System its share of the system-wide actuarial determined contribution, in accordance with Chapter 32, Section 22D of MGL, apportioned among the employers based on annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. For the year ended December 31, 2017, active member contributions totaled \$31,592,837 and employer contributions totaled \$50,599,326.

Contributions are recognized as additions in the period when they become due pursuant to formal commitments, statutory or contractual requirements. Benefits and refunds are recognized as deductions when incurred and administrative expenses are funded through investment earnings.

Except for a portion of benefits owed due to cost-of-living adjustments (COLA's) granted through June 30, 1998, member employers are required to contribute the remaining amounts necessary to finance benefits. Member employer contributions are determined by actuarial valuations.

COLA's granted through June 30, 1998 are reimbursed by the Commonwealth of Massachusetts (the Commonwealth). COLA's granted subsequent to June 30, 1998 must be granted by the Board and are the responsibility of the System. COLA may be approved in excess of the Consumer Price Index but not to exceed 3% of the base retirement allowance.

A COLA was granted to eligible retirees and survivors effective July 1, 2017. The 3% COLA was paid on a base of \$16,000 (maximum \$480).

WORCESTER REGIONAL RETIREMENT SYSTEM
 NOTES TO FINANCIAL STATEMENTS
 FOR THE YEAR ENDED DECEMBER 31, 2017

NOTE 5 - NET PENSION LIABILITY

The components of the net pension liability of the System at December 31, 2017, were as follows:

Total pension liability	\$ 1,521,421,139
Plan fiduciary net position	<u>(705,993,287)</u>
Net pension liability	<u>\$ 815,427,852</u>
 Plan fiduciary net position as a percentage of the total pension liability	 46.40%

Actuarial Assumptions

The total pension liability was determined by an actuarial valuation as of January 1, 2016, using the following actuarial assumptions, applied to all periods included in the measurement that was updated to December 31, 2017:

Inflation:	3.0% per year
Salary increases:	Group 1: 4.25-6.00%, based on service Group 4: 4.75%-7.00%, based on service
Investment rate of return:	7.75%, net of pension plan investment expense, including inflation
Mortality rates:	Based on the RP-2000 Mortality Table (base year 2009) with full generational mortality improvement using Scale BB. For disabled lives, the mortality rates were based on the RP-2000 Mortality Table (base year 2012) with full generational mortality improvement using Scale BB.

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 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 rates of return by the target asset allocation percentage and by adding expected inflation. Best estimates of arithmetic rates of return for each major asset class included in the pension plan's target asset allocation as of December 31, 2017 (see the discussion of the System's investment policy) are summarized in the following table:

Asset Class	Long-Term Expected Rate of Return (%)
Global Equity	4.91
Fixed Income	2.04
Private Equity	6.50
Real Estate	3.70
Timber/Natural Resources	3.25
Hedge Funds	3.40

WORCESTER REGIONAL RETIREMENT SYSTEM
 NOTES TO FINANCIAL STATEMENTS
 FOR THE YEAR ENDED DECEMBER 31, 2017

Discount Rate

The discount rate used to measure the total pension liability was 7.75 percent. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rates and that member employer contributions will be made in accordance with Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws. Based on those assumptions, the System's fiduciary net position was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

Sensitivity of the Net Pension Liability to Changes in the Discount Rate

The following presents the net pension liability of the System calculated using the discount rate of 7.75 percent, as well as what the System's net pension liability would be if it were calculated using a discount rate that is 1-percentage-point lower (6.75 percent) or 1-percentage-point higher (8.75 percent) than the current rate:

	<u>1% Decrease</u> (6.75%)	<u>Current Discount Rate</u> (7.75%)	<u>1% Increase</u> (8.75%)
Net pension liability	993,831,171	815,427,852	664,765,107

NOTE 6 - LEGALLY REQUIRED RESERVE ACCOUNTS

The balance in the System's legally required reserves as of December 31, 2017 are as follows:

<u>Description</u>	<u>Amount</u>	<u>Purpose</u>
Annuity Savings Fund	\$ 274,388,786	Active members' contribution balance
Annuity Reserve Fund	71,436,738	Retired members' contribution account
Military Service Fund	141,576	Members' contribution account while on military leave
Pension Reserve Fund	358,988,758	Amounts appropriated to fund future retirement
Pension Fund	<u>1,037,429</u>	Remaining net position
Total	<u>\$ 705,993,287</u>	

All reserve accounts are funded at levels required by state law.

NOTE 7 - CONTINGENCIES

Approximately \$6,264,000 of the reimbursements and transfers to other systems liability reported in the financial statements represents amounts billed to the System by the Commonwealth of Massachusetts State Board of Retirement (State Board) related to obligations pursuant to MGL, c.32 Section 3(8)(c). The System disputes the liability based on various considerations, such as inaccurate reimbursement calculations, reimbursements not attributable to the System and lack of documentation.

The System is in the process of attempting to revise the liability with the State Board. The outcome of this process is not presently determinable and the effect on the System's financial statements cannot be determined at this time.

Required Supplementary Information

WORCESTER REGIONAL RETIREMENT SYSTEM
 REQUIRED SUPPLEMENTARY INFORMATION
 DECEMBER 31, 2017

SCHEDULE OF CHANGES IN EMPLOYERS' NET PENSION LIABILITY AND RELATED RATIOS (1)

	<u>2016</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
<u>Total pension liability</u>				
Service cost	\$ 42,736,040	35,984,130	31,996,981	31,996,981
Interest	112,224,318	99,124,367	91,276,045	84,568,061
Changes of benefit terms		-	49,721,211	-
Differences between expected and actual experience		8,235,183	-	-
Changes of assumptions		94,194,565	31,534,870	-
Benefit payments, including refunds of member contributions	<u>(77,717,794)</u>	<u>(72,799,275)</u>	<u>(68,086,158)</u>	<u>(61,338,289)</u>
Net change in total pension liability	77,242,564	164,738,970	136,442,949	55,226,753
Total pension liability - beginning	<u>1,444,178,575</u>	<u>1,279,439,605</u>	<u>1,142,996,656</u>	<u>1,087,769,903</u>
Total pension liability - ending (a)	<u>\$ 1,521,421,139</u>	<u>1,444,178,575</u>	<u>1,279,439,605</u>	<u>1,142,996,656</u>
<u>Plan fiduciary net position</u>				
Contributions - employers	\$ 50,599,326	48,574,831	44,986,040	39,519,038
Contributions - members	31,592,837	29,032,767	52,111,046	27,066,085
Net investment income	103,123,070	40,509,286	1,177,960	40,135,521
Benefit payments, including refunds of member contributions	<u>(77,717,794)</u>	<u>(72,799,275)</u>	<u>(68,086,158)</u>	<u>(61,338,289)</u>
Administrative expense	<u>(1,145,509)</u>	<u>(1,170,184)</u>	<u>(1,055,662)</u>	<u>(1,054,297)</u>
Other	<u>(7,043,455)</u>	<u>(7,195,247)</u>	<u>(7,429,438)</u>	<u>(3,178,354)</u>
Net change in plan fiduciary net position	99,408,475	36,952,178	21,703,788	41,149,704
Plan fiduciary net position - beginning	<u>606,584,812</u>	<u>569,632,634</u>	<u>547,928,846</u>	<u>506,779,142</u>
Plan fiduciary net position - ending (b)	<u>\$ 705,993,287</u>	<u>606,584,812</u>	<u>569,632,634</u>	<u>547,928,846</u>
Net pension liability - ending (a) - (b)	<u>\$ 815,427,852</u>	<u>837,593,763</u>	<u>709,806,971</u>	<u>595,067,810</u>
Plan fiduciary net position as a percentage of the total pension liability	46.40%	42.00%	44.52%	47.94%
Covered-employee payroll	\$ 271,037,131	282,918,805	269,899,678	252,829,591
Net pension liability as a percentage of covered-employee payroll	300.85%	296.05%	262.99%	235.36%

(1) Data is being accumulated annually to present 10 years of the reported information.

See Accompanying Independent Auditors' Report

WORCESTER REGIONAL RETIREMENT SYSTEM
 REQUIRED SUPPLEMENTARY INFORMATION
 DECEMBER 31, 2017

SCHEDULE OF EMPLOYER CONTRIBUTIONS

	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>
Actuarially determined contribution	\$ 50,599,326	48,574,831	44,986,040	39,519,038	39,113,142
Contributions in relation to the actuarially determined contribution	<u>50,599,326</u>	<u>48,574,831</u>	<u>44,986,040</u>	<u>39,519,038</u>	<u>39,113,142</u>
Contribution deficiency (excess)	<u>\$ -</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Covered-employee payroll	\$ 271,037,131	282,918,805	269,899,678	252,829,591	252,829,591
Contributions as a percentage of covered-employee payroll	18.67%	17.17%	16.67%	15.63%	15.47%

(continued)

	<u>2012</u>	<u>2011</u>	<u>2010</u>	<u>2009</u>	<u>2008</u>
Actuarially determined contribution	\$ 34,534,582	32,578,418	30,733,672	28,423,939	26,433,628
Contributions in relation to the actuarially determined contribution	<u>34,534,582</u>	<u>32,578,418</u>	<u>30,733,672</u>	<u>28,423,939</u>	<u>26,433,628</u>
Contribution deficiency (excess)	<u>\$ -</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Covered-employee payroll	\$ 238,952,079	238,952,079	241,992,607	241,992,607	211,518,755
Contributions as a percentage of covered-employee payroll	14.45%	13.63%	12.70%	11.75%	12.50%

(concluded)

SCHEDULE OF INVESTMENT RETURNS (1)

	<u>2017</u>	<u>2016</u>	<u>2015</u>	<u>2014</u>
Annual money-weighted rate of return, net of investment expense	16.71%	7.06%	0.05%	7.79%

(1) Data is being accumulated annually to present 10 years of the reported information.

See Accompanying Independent Auditors' Report

WORCESTER REGIONAL RETIREMENT SYSTEM
NOTES TO REQUIRED SUPPLEMENTARY INFORMATION
DECEMBER 31, 2017

NOTE A - METHODS AND ASSUMPTIONS USED IN CALCULATIONS OF ACTUARIALLY DETERMINED CONTRIBUTIONS

The following were the actuarial methods and assumptions used to determine contribution rates reported in the Schedule of Employer Contributions:

Actuarial cost method (2014-2017):	Entry age normal
Amortization method (2014-2017):	Payment increases 4.0% per year, except for Early Retirement Incentive (ERI) Programs for 2002 and 2003 (4.5%) and 2010 (level dollar)
Remaining amortization period (2014-2017):	19 years
Asset valuation method (2014-2017):	5-year smoothed market value
Inflation (2014-2015):	3.5%
Inflation (2016-2017):	3.0%
Salary increases (2014-2015):	3.0%
Salary increases (2016-2017):	Group 1: 6%-4.25%, based on service; Group 4: 7%-4.75%, based on service
Investment rate of return (2014-2015):	8.00%
Investment rate of return (2016-2017):	7.75%