



WORCESTER REGIONAL RETIREMENT SYSTEM

**ACTUARIAL VALUATION
as of
January 1, 2020**

KMS Actuarial, LLC
52 Hunt Road
Kingston, NH 03848

November, 2020



November 20, 2020

Worcester Regional Retirement Board
Midstate Office Park
23 Midstate Drive, Suite 106
Auburn, MA 01501

Dear Board Members:

We are pleased to present the enclosed report providing the results of our actuarial valuation of the Worcester Regional Retirement System as of January 1, 2020. Our valuation was performed in accordance with the provisions contained in Chapter 32 of the Massachusetts General Laws, "M.G.L.", as of January 1, 2020. Disclosures under GASB Statement No. 67, Financial Reporting for Pension Plans (GASB 67) and GASB Statement No. 68, Accounting and Financial Reporting for Pensions (GASB 68) are provided in a separate report.

The principal results of our valuation are summarized in Section 2. The Summary of Plan Provisions and Actuarial Assumptions and Methods are shown in Sections 5 and 6, respectively. Section 7 summarizes the demographic profile of active members, retired plan members and beneficiaries and disabled plan members. Asset information and actuarial liabilities are presented in Section 2. The development of the required appropriations pursuant to Chapter 32 of the M.G.L. is shown in Section 3, including a 30-year forecast of the required appropriations and projected cash flows. Section 4 includes a summary of valuation information for PERAC as well as information relating to the primary risks to the System and an assessment of those risks.

This valuation is based upon member data provided by the Worcester Regional Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Retirement Board. Although we did not audit the data used in the valuation, we believe that the information is complete and reliable.

Liabilities presented in this report are based on a long-term investment return rate assumption of 7.65%, net of investment expense, compounded annually.

This report was completed in accordance with generally accepted actuarial standards and procedures, and conforms to the Code of Professional Conduct of the American Academy of Actuaries. The actuarial assumptions used in the determination of costs are reasonably related to the experience of the System and to reasonable expectations, and represent our best estimate of anticipated long-term experience under the System.

K M S A C T U A R I E S

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Future actuarial valuation results may differ significantly from the current results presented in this report. Examples of potential sources of volatility include plan experience differing from that anticipated by the economic or demographic assumptions, the effect of new entrants, changes in economic or demographic assumptions, the effect of law changes and the delayed effect of smoothing techniques.

Our valuation follows generally accepted actuarial methods and we perform such tests as we consider necessary to assure the accuracy of the results. The amounts presented in this report have been appropriately determined according to the actuarial assumptions and methods stated herein.

This report is intended for the sole use of the Worcester Regional Retirement Board and is intended to provide information to comply with the stated purpose of the report. It may not be appropriate for other purposes.

The undersigned credentialed actuaries are Members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries necessary to render the actuarial opinion contained herein. They are available to answer any questions with regard to this report.

Respectfully submitted,



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TABLE OF CONTENTS

SECTION 1	EXECUTIVE SUMMARY	1
SECTION 2	PRINCIPAL VALUATION RESULTS	5
	Market Value of Assets	
	Actuarial Value of Assets	
	Actuarial Liabilities	
	Actuarial Experience	
SECTION 3	CHAPTER 32 OF M.G.L. APPROPRIATIONS	13
	Annual Appropriations	
	Exhibit 3.1 - 30-Year Forecast of Annual Appropriations	
	Exhibit 3.2 - 30-Year Forecast of Cash Flow	
	Forecast Notes	
SECTION 4	DISCLOSURES	18
	4.1 - GASB 67 and GASB 68 Disclosures	
	4.2 - PERAC Disclosure Information	
	4.3 - Risk Measures	
SECTION 5	SUMMARY OF PLAN PROVISIONS	25
SECTION 6	ACTUARIAL ASSUMPTIONS AND METHODS	30
SECTION 7	PLAN MEMBER INFORMATION	35
	Exhibit 7.1 - Summary of Census Data	
	Exhibit 7.2 - Active Members by Age and Years of Service	
	Exhibit 7.3 - Retired and Disabled Plan Members and Beneficiaries	
SECTION 8	GLOSSARY OF TERMS	38
SECTION 9	MEMBER UNIT FY2022 APPROPRIATION	40

SECTION 1 - EXECUTIVE SUMMARY

Background

We have completed the Actuarial Valuation of the Worcester Regional Retirement System as of January 1, 2020. This valuation is based upon census data provided by the Retirement Board and asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Worcester Regional Retirement Board. Information for the prior valuation completed as of January 1, 2018 was obtained from the valuation report prepared by KMS Actuaries, LLC.

Massachusetts General Laws

The valuation was prepared in accordance with Chapter 32 of the Massachusetts General Laws ("M.G.L."). The results are based on the active, inactive and retired members and beneficiaries as of December 31, 2019, the assets as of December 31, 2019 and assumptions regarding investment returns, salary increases, mortality, turnover, disability and retirement.

The valuation does not take into consideration:

- ◆ Changes in the law after the valuation date,
- ◆ Transfers between retirement systems pursuant to Section 3(8)(c) of Chapter 32,
- ◆ State-mandated benefits and
- ◆ Cost-of-living increases granted to members in pay status between 1982 and 1997.

GASB Statement Numbers 67 and 68

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, Financial Reporting for Pension Plans, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, Accounting and Financial Reporting for Pensions, replaced the requirements of Statement No. 27.

The pension standards reflect changes from those previously in place regarding how governments calculate total pension liability and pension expense. Further, the standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

The required disclosures and notes under GASB Statement Number 67 and 68 for the fiscal year ending December 31, 2019 are provided in a separate report.

Assets

This valuation is based upon asset information reported to the Public Employee Retirement Administration Commission (PERAC) by the Worcester Regional Retirement Board. The market value of assets increased from \$710,205,259 as of December 31, 2017 to \$801,451,132 as of December 31, 2019. During the plan years ended 2018 and 2019, the market value rates of return were -1.91% and 16.61%, respectively.

The actuarial value of assets increased from \$685,488,133 as of January 1, 2018 to \$777,921,762 as of January 1, 2020. During the plan years ended 2018 and 2019, the rates of return on the actuarial value of assets were 6.12% and 7.17%, respectively.

SECTION 1 - EXECUTIVE SUMMARY

Changes Since the Last Valuation

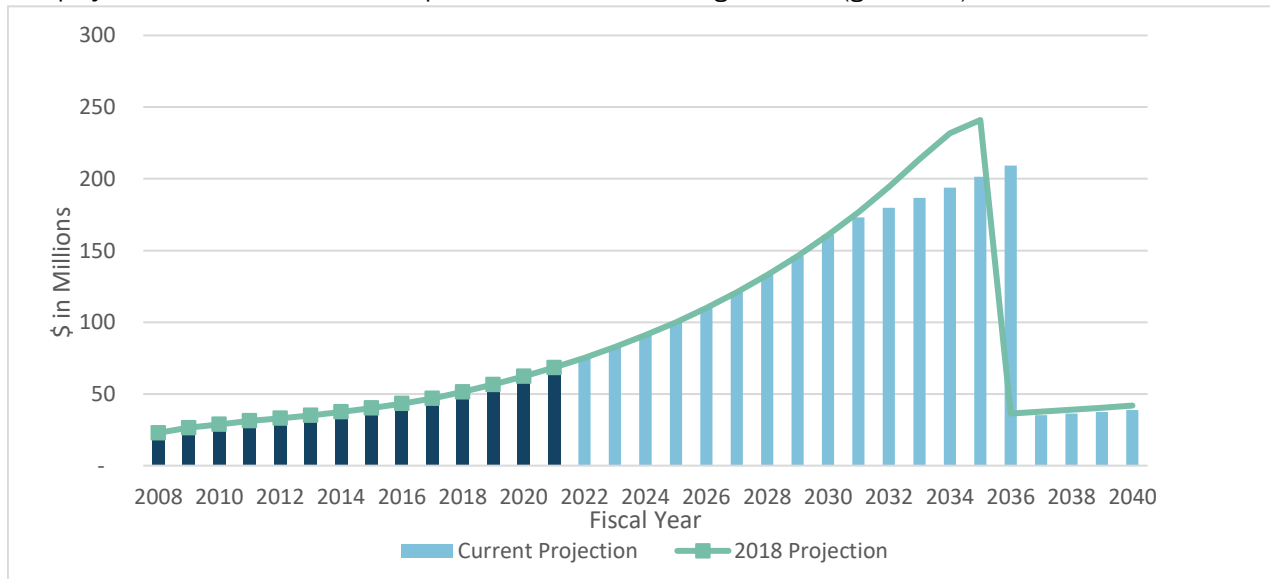
During the two years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to increase from \$829,135,167 as of January 1, 2018 to \$854,248,469 as of January 1, 2020, for a total increase of \$25,113,302. The actual unfunded actuarial accrued liability, before any assumption or plan changes, was \$873,654,950, resulting in an actuarial loss of \$19,406,481. The actuarial loss was primarily due to an asset loss of approximately \$16,242,000 and a demographic experience loss of approximately \$3,164,000. The details of the gain and loss analysis are provided in Section 2, Actuarial Experience.

Appropriations

The funding appropriation for each year is computed as the sum of the normal cost, net 3(8)(c) transfers and an amortization payment to pay off the Unfunded Actuarial Liability, adjusted for semi-annual payments of the appropriation made July 1 and January 1. The appropriation calculated as of the January 1, 2020 valuation is \$93,230,332, and is made up of a normal cost payment of \$17,342,550, net 3(8)(c) transfers of \$3,312,312, and an amortization payment of \$72,575,470. The amortization method is an increasing amortization of the unfunded actuarial accrued liability at 4% over 16 years and is expected to fully pay the unfunded actuarial accrued liability by the year 2036. The development of the appropriation as of January 1, 2020 is presented in Section 3, Annual Appropriations.

For fiscal year 2021, we show the actual appropriation developed under the previous funding schedule and reported on the PERAC "Required Fiscal Year 2021 Appropriation" letter dated December 12, 2019 of \$68,444,153. For fiscal year 2022, we developed an annual appropriation of \$75,254,346, which is made up of a normal cost of \$23,466,626, including net 3(8)(c) transfers of \$4,500,000, and payment toward the unfunded actuarial accrued liability of \$51,787,720. The unfunded actuarial accrued liability is expected to be fully paid by 2036. The Board adopted a schedule that limits the annual increase in appropriation to 9.95% for each year. The current funding schedule is shown in Section 3, Exhibit 3.1.

The chart below shows the historical (navy bars) and projected (blue bars) annual appropriations compared to the projected amounts shown in the prior valuation and funding schedule (green line).



SECTION 1 - EXECUTIVE SUMMARY

Plan Provisions

All Plan provisions used in this valuation are the same as those used in the prior valuation and are summarized in Section 5, Summary of Plan Provisions.

Actuarial Assumptions and Methods

Some Actuarial Assumptions and Methods used in this valuation have changed since the last valuation, including decreasing the investment return rate from 7.75% to 7.65%, increasing administrative expense assumption from \$1,100,000 to \$1,200,000, modifying the net 3(8)(c) transfers assumption from \$3,500,000 to \$4,500,000 for FY2022-FY2026 and \$3,500,000 thereafter, and updating the mortality and mortality improvement rates. Changing these assumptions resulted in a net increase in the unfunded actuarial accrued liability of \$24,911,914 and an increase in the employer normal cost of \$689,655. The Actuarial Assumptions and Methods utilized in this valuation are detailed in Section 6, Actuarial Assumptions and Methods.

Census Data

As of January 1, 2020, there are 7,024 active members who may be eligible for benefits in the future, 3,524 retirees and beneficiaries, 2,247 inactives and 278 disabled retirees. Summaries of the active, retired and disabled employees are included in Section 7, Plan Member Information.

SECTION 1 - EXECUTIVE SUMMARY

A summary of principal valuation results from the current valuation and the prior valuation follows.

Valuation Date	January 1, 2020	January 1, 2018	% Change
Census Data			
Active Members	7,024	6,934	1.3%
Valuation Salary	\$331,209,833	\$304,282,620	8.8%
Average Salary	\$47,154	\$43,883	7.5%
Retired Members and Beneficiaries	3,524	3,351	5.2%
Total Annual Retirement Allowance	\$77,525,219	\$68,184,912	13.7%
Average Annual Retirement Allowance	\$21,999	\$20,348	8.1%
Disabled Members	278	270	3.0%
Total Annual Retirement Allowance	\$9,589,804	\$8,731,339	9.8%
Average Annual Retirement Allowance	\$34,496	\$32,338	6.7%
Inactive Members	2,247	1,978	13.6%
Annuity Savings Fund	\$26,500,968	\$18,530,021	43.0%
Funded Status			
Actuarial Accrued Liability (AAL)	\$1,676,488,626	\$1,514,623,300	10.7%
Market Value of Assets (MVA)	\$801,451,132	\$710,205,259	12.8%
Unfunded Accrued Liability on MVA	\$875,037,494	\$804,418,041	8.8%
Funded Status on MVA	47.8%	46.9%	1.9%
Actuarial Value of Assets (AVA)	\$777,921,762	\$685,488,133	13.5%
Unfunded Accrued Liability on AVA	\$898,566,864	\$829,135,167	8.4%
Funded Status on AVA	46.4%	45.3%	2.4%
Appropriations			
Fiscal Year 2020	N/A	\$62,250,254	N/A
Fiscal Year 2021	\$68,444,154	\$68,444,153	0.0%
Fiscal Year 2022	\$75,254,346	\$75,254,348	0.0%
Fiscal Year 2023	\$82,742,153	\$82,742,155	0.0%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Market Value of Assets

Asset information is reported annually to the Public Employee Retirement Administration Commission by the Worcester Regional Retirement Board. The Market Value of Assets for the three most recent calendar years are as follows:

Calendar Year	2019	2018	2017
Trust Fund Composition at Year-End			
Cash	\$2,813,343	\$2,840,100	\$2,919,956
Short-Term Investments	0	0	0
Fixed Income Securities	0	0	0
Equities	0	0	0
Pooled Short Term Funds	0	0	0
Pooled Domestic Equity Funds	0	0	0
Pooled International Equity Funds	0	0	0
Pooled Global Equity Funds	0	0	0
Pooled Domestic Fixed Income Funds	0	0	0
Pooled International Fixed Income Funds	0	0	0
Pooled Global Fixed Income Funds	0	0	0
Pooled Alternative Investments	1,187,279	1,367,019	2,863,638
Pooled Real Estate Funds	0	0	449,652
Pooled Domestic Balanced Funds	0	0	0
Pooled International Balanced Funds	0	0	0
Hedge Funds	0	0	0
PRIT Cash	0	0	0
PRIT Fund	801,583,801	688,874,681	705,763,910
Interest Due & Accrued	0	0	0
Prepaid Expenses	0	0	0
Accounts Receivable	5,363,063	4,447,865	4,281,182
Land	0	0	0
Buildings	0	0	0
Accumulated Depreciation - Buildings	0	0	0
Accounts Payable	(9,496,354)	(7,230,926)	(6,073,079)
Total Market Value of Assets	\$801,451,132	\$690,298,739	\$710,205,259

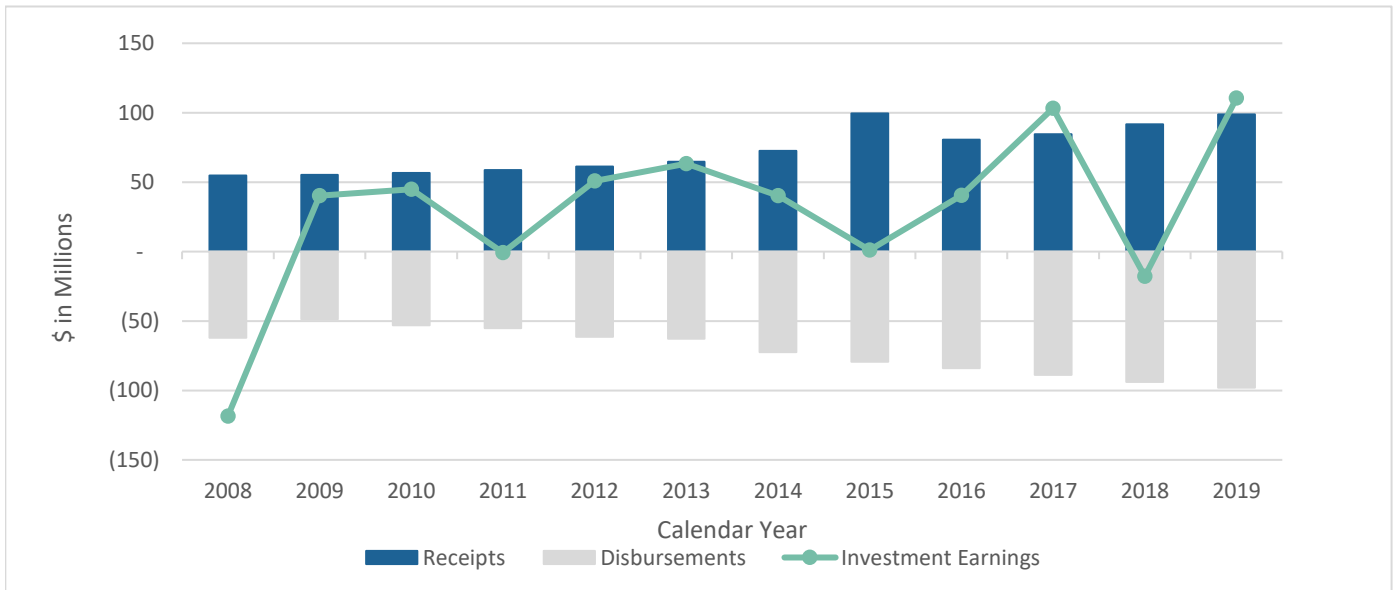
SECTION 2 - PRINCIPAL VALUATION RESULTS

Market Value of Assets

Calendar Year	2019	2018	2017
Funds			
Annuity Savings Fund	\$297,120,738	\$285,694,921	\$274,388,785
Annuity Reserve Fund	78,748,966	74,559,145	71,436,739
Special Military Service Fund	129,449	148,744	141,576
Pension Fund	3,655,463	3,618,492	1,037,428
Expense Fund	0	0	0
Pension Reserve Fund	421,796,516	326,277,437	363,200,731
Total Market Value of Assets	\$801,451,132	\$690,298,739	\$710,205,259
Asset Activity			
Market Value as of Beginning of Year	\$690,298,739	\$710,205,259	\$611,250,516
Contributions and Receipts	98,693,701	91,590,804	84,608,085
Benefit Payments and Expenses	(98,012,054)	(93,730,657)	(88,780,059)
Investment Return	110,470,746	(17,766,667)	103,126,717
Total Market Value of Assets	\$801,451,132	\$690,298,739	\$710,205,259

Rate of Return 16.61% -1.91% 17.58%

Below are the receipts and disbursements during the last 12 years. The green line reflects investment earnings, which vacillate as investment markets fluctuate. Blue bars indicate contributions, from employees and employers, and grey bars show benefit payments and administrative expenses.



SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Value of Assets

The Actuarial Value of Assets is the market value of assets as of the valuation date adjusted to phase in investment gains and losses over a 5-year period, further constrained to be within 20% of the market value of assets. Investment gains and losses are the excess or deficiency of the expected returns over the actual returns.

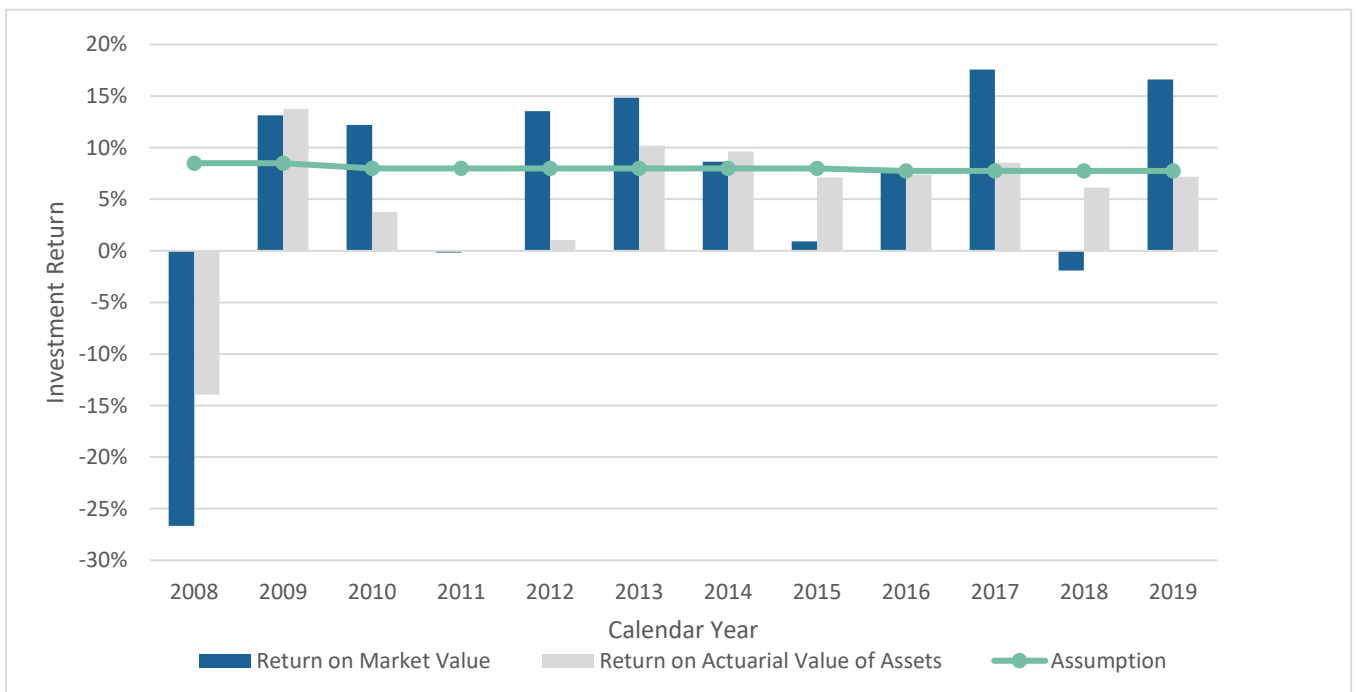
Valuation Date	January 1, 2020	January 1, 2019	January 1, 2018	
1. Expected Market Value of Assets				
a. Market Value of Assets as of prior January 1	\$690,298,739	\$710,205,259	\$611,250,516	
b. Prior Year Contributions and Receipts	98,693,701	91,590,804	84,608,085	
c. Prior Year Benefit Payments and Expenses	(98,012,054)	(93,730,657)	(88,780,059)	
d. Expected Investment Return Rate	7.75%	7.75%	7.75%	
e. Expected Investment Return	53,526,767	54,951,078	47,196,779	
f. Expected Market Value of Assets	\$744,507,153	\$763,016,484	\$654,275,321	
2. Prior Year Gain/(Loss)				
a. Market Value of Assets as of January 1	\$801,451,132	\$690,298,739	\$710,205,259	
b. Expected Market Value of Assets	744,507,153	763,016,484	654,275,321	
c. Prior Year Gain /(Loss)	\$56,943,979	(\$72,717,745)	\$55,929,938	
3. Phase-In of Asset Gains and Losses				
Calendar Year	Gain / (Loss)	Unrecognized Gain / (Loss)	Unrecognized Gain / (Loss)	Unrecognized Gain / (Loss)
a. 2019	\$56,943,979	\$45,555,183	\$0	\$0
b. 2018	(72,717,745)	(43,630,647)	(58,174,196)	0
c. 2017	55,929,938	22,371,975	33,557,963	44,743,950
d. 2016	(3,835,703)	(767,141)	(1,534,281)	(2,301,422)
e. 2015	(43,896,094)	0	(8,779,219)	(17,558,438)
f. 2014	(834,822)	0	0	(166,964)
g. Total Deferred Gains/(Losses)	\$23,529,370	(\$34,929,733)	\$24,717,126	

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Value of Assets

Valuation Date	January 1, 2020	January 1, 2019	January 1, 2018
4. Actuarial Value of Assets			
a. Market Value of Assets	\$801,451,132	\$690,298,739	\$710,205,259
b. Deferred Gains/(Losses)	23,529,370	(34,929,733)	24,717,126
c. Market Value of Assets Less Deferred Gains/(Losses)	\$777,921,762	\$725,228,472	\$685,488,133
d. 80% of Market Value of Assets	641,160,906	552,238,991	568,164,207
e. 120% of Market Value of Assets	961,741,358	828,358,487	852,246,311
f. Actuarial Value of Assets, a., but not less than b. and not greater than c.	\$777,921,762	\$725,228,472	\$685,488,133
g. Ratio of Actuarial Value of Assets to Market Value of Assets	97.1%	105.1%	96.5%
5. Rate of Return on Actuarial Value of Assets for Prior Calendar Year			
	7.17%	6.12%	8.55%

Below are the investment returns during the last 12 years. The green line reflects the investment return actuarial assumption. Blue bars indicate investment return rates on market value of assets, and grey bars show investment return rates on actuarial value of assets.



SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Liabilities

The **Actuarial Present Value of Future Benefits** is the present value of the cost to finance all benefits payable in the future, discounted to reflect the probability of payment and the time value of money. Below is the Actuarial Present Value of Future Benefits from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Actives	\$1,179,829,116	\$1,092,799,805
Retired Members and Beneficiaries	771,173,424	673,804,622
Disabled Members	111,086,221	102,003,269
Inactive Members	26,500,968	18,530,021
Total Present Value of Future Benefits	\$2,088,589,729	\$1,887,137,717

The **Actuarial Accrued Liability** is the portion of the Actuarial Present Value of Future Benefits which is allocated to all periods prior to a valuation year and therefore is not provided for by future Normal Costs. Below is the Actuarial Accrued Liability from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Actives	\$767,728,013	\$720,285,388
Retired Members and Beneficiaries	771,173,424	673,804,622
Disabled Members	111,086,221	102,003,269
Inactive Members	26,500,968	18,530,021
Total Actuarial Accrued Liability	\$1,676,488,626	\$1,514,623,300

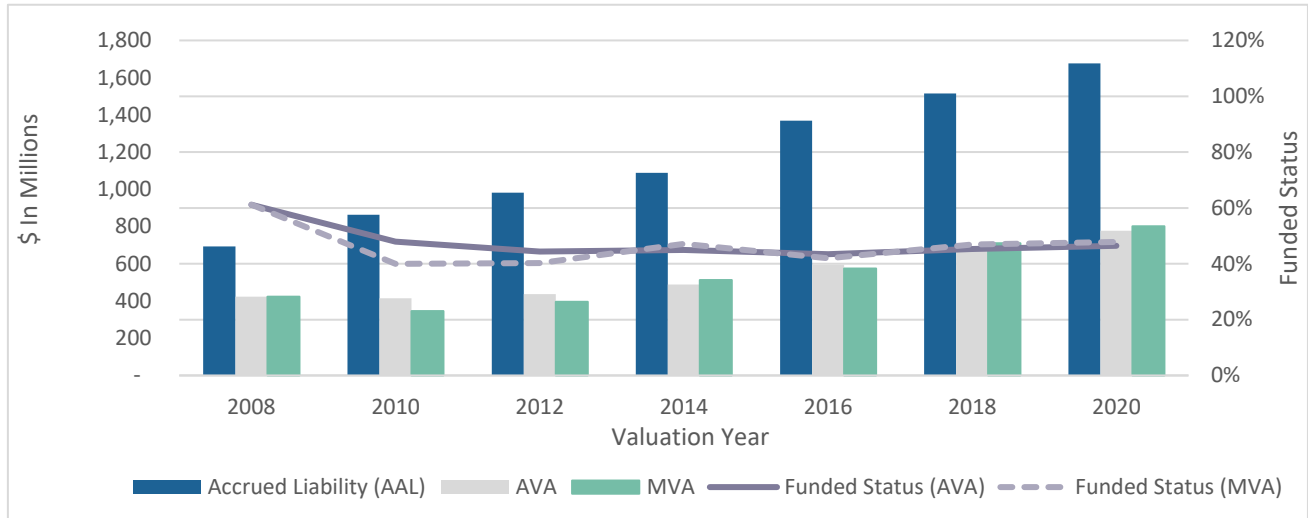
The **Unfunded Actuarial Accrued Liability** is the difference between the Actuarial Accrued Liability and the Actuarial Value of Assets as of the valuation date. The **Funded Status** is the Actuarial Value of Assets divided by the Actuarial Accrued Liability and is a point-in-time measurement of the amount of assets set aside to cover actuarial accrued liabilities. Below is the Unfunded Actuarial Accrued Liability and Funded Status from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Unfunded Actuarial Accrued Liability		
a. Actuarial Accrued Liability	\$1,676,488,626	\$1,514,623,300
b. Actuarial Value of Assets	777,921,762	685,488,133
c. Unfunded Actuarial Accrued Liability (a. - b.)	\$898,566,864	\$829,135,167
d. Funded Status (b. divided by a.)	46.4%	45.3%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Liabilities

Below are the accrued liabilities, asset values (actuarial and market) and funded status for each of the last 7 valuations. The purple solid line reflects the funded status on an actuarial value of assets (AVA) basis and the purple dotted line reflects the funded status on a market value (MVA) basis. Blue bars indicate actuarial accrued liabilities, grey bars indicate actuarial value of assets and green bars indicate market value of assets.



The **Normal Cost** is the portion of the Actuarial Present Value of Future Benefits which is allocated to a valuation year. Only active employees who have not reached Normal Retirement Age incur a Normal Cost. Below is the Normal Cost from the current valuation and the prior valuation:

Valuation Date	January 1, 2020	January 1, 2018
Total Normal Cost	\$48,003,871	\$43,715,955
As of Percentage of Salary	14.5%	14.4%
Employee Normal Cost	\$31,796,971	\$28,880,357
As of Percentage of Salary	9.6%	9.5%
Administrative Expenses	\$1,135,650	\$1,040,292
As a Percentage of Salary	0.3%	0.3%
Net Employer Normal Cost	\$17,342,550	\$15,875,890
As a Percentage of Salary	5.2%	5.2%

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Experience

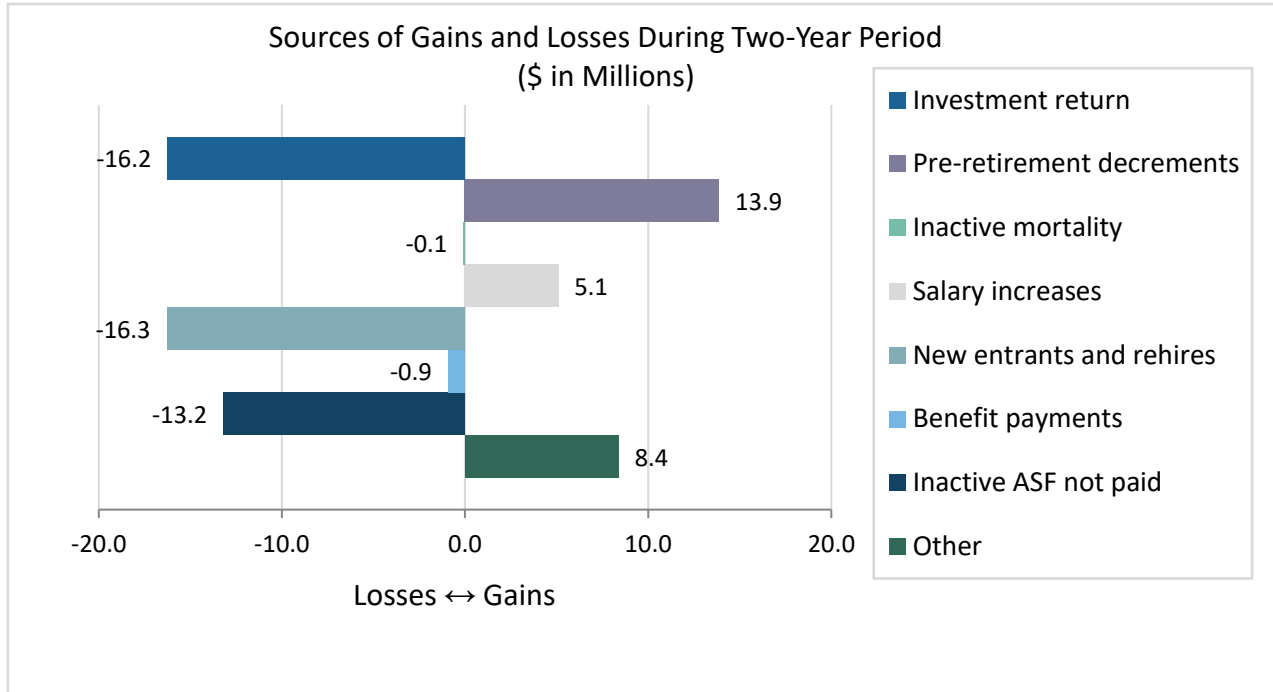
In performing the actuarial valuation, various assumptions are made regarding mortality, retirement, disability and withdrawal rates as well as salary increases and investment returns. A comparison of the results of the current valuation and the prior valuation is made to determine how closely actual experience relates to expected. During the two years since the last valuation, the total unfunded actuarial accrued liability of the System was expected to increase by \$25,113,302. Below is the development of the Actuarial Loss for the current 2-year period:

Calendar Year Ending	December 31, 2019	December 31, 2018
Expected Unfunded Actuarial Accrued Liability		
1. Unfunded Actuarial Accrued Liability, beginning of year	\$845,061,374	\$829,135,167
2. Normal cost, beginning of year	43,184,797	43,715,955
3. Total contributions	98,693,701	91,590,804
4. Interest (full year on 1. and 2., monthly-weighted on 3.)	64,695,999	63,801,056
5. Expected Unfunded Actuarial Accrued Liability	\$854,248,469	\$845,061,374
6. Unfunded Actuarial Accrued Liability (before changes)	873,654,950	
7. (Gain)/Loss (6. - 5.)	\$19,406,481	
Asset Gain/(Loss)		
1. Actuarial Value of Assets, Beginning of Year	\$725,228,472	\$685,488,133
2. Contributions and Receipts	98,693,701	91,590,804
3. Benefit Payments and Expenses	(98,012,054)	(93,730,657)
4. Assumed Rate of Return (prior valuation)	7.75%	7.75%
5. Expected Return	56,233,822	53,035,501
6. Actuarial Value of Assets, End of Year	\$777,921,762	\$725,228,472
7. Actual Return	52,011,643	41,880,192
8. Actual Rate of Return	7.17%	6.12%
9. Asset Gain/(Loss) (7. - 5.)	(4,222,179)	(11,155,309)
10. Total Asset Gain/(Loss), 2-Year Period	(\$16,242,024)	

SECTION 2 - PRINCIPAL VALUATION RESULTS

Actuarial Experience

Below are the various sources of gains and losses over the 2-year period. The asset loss during the period was \$16,242,024, and the total demographic loss during the period was \$3,164,457, which totals to an overall loss of \$19,406,481.



Unfunded Actuarial Accrued Liability

1. Changes due to:	
a. Asset Loss	\$16,242,024
b. Demographic Experience Loss	3,164,457
c. Total Loss Prior to Changes	19,406,481
d. Plan Change	-
e. Assumption Changes	24,911,914
f. Total Increase (including changes)	44,318,395
2. Unfunded Actuarial Accrued Liability, End of Year	\$898,566,864

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Annual Appropriations

The Annual Appropriation is determined in accordance with the requirements set forth in Sections 22D and 22F of Chapter 32 of the Massachusetts General Laws ("M.G.L."). The appropriation is comprised of the annual employer normal cost and amortization payments to pay the unfunded actuarial accrued liability. Below are the details of the annual appropriations for the current and prior valuations, adjusted for semi-annual payments made July 1 and January 1. The appropriations shown are based on the results of the valuation and do not account for any adjustments made to appropriations in the selected funding schedule.

Valuation Date	January 1, 2020	January 1, 2018
1. Early Retirement Incentive Plan (2002)		
Fully Funded Year	2028	2028
Investment Return Rate	7.65%	7.75%
Balance as of Valuation Date	\$10,592,821	\$11,776,015
Amortization Amount	\$1,465,746	\$1,346,399
Increasing Rate	4.50%	4.50%
Remaining Payment Period from Valuation Date	8	10
2. Early Retirement Incentive Plan (2003)		
Fully Funded Year	2028	2028
Investment Return Rate	7.65%	7.75%
Balance as of Valuation Date	\$2,076,849	\$2,308,827
Amortization Amount	\$287,377	\$263,977
Increasing Rate	4.50%	4.50%
Remaining Payment Period from Valuation Date	8	10
3. Early Retirement Incentive Plan (2010)		
Fully Funded Year	2022	2022
Investment Return Rate	7.65%	7.75%
Balance as of Valuation Date	\$10,522	\$19,582
Amortization Amount	\$5,455	\$5,456
Increasing Rate	0.00%	0.00%
Remaining Payment Period from Valuation Date	2	4
3. Unfunded Actuarial Accrued Liability		
Fully Funded Year	2036	2035
Balance as of Valuation Date	\$885,886,672	\$815,030,743
Amortization Amount	\$70,816,892	\$62,701,364
Increasing Rate	4.00%	4.00%
Remaining Payment Period from Valuation Date	16	17

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Annual Appropriations

4. Total Amortization Payments	\$72,575,470	\$64,317,196
5. Normal Cost	\$17,342,550	\$15,875,890
6. Net 3(8)(c) Transfers	\$3,312,312	\$3,310,021
7. Total Appropriation as of January 1	\$93,230,332	\$83,503,107
8. Adjusted for Semi-Annual Payments as of July 1 and January 1	\$98,513,106	\$88,295,787

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.1 - 30-Year Forecast of Annual Appropriations

Fiscal Year Ending	Employer Normal Cost	Amortization Payment of UAL	Amortization Payment of ERI 2002	Amortization Payment of ERI 2003	Amortization Payment of ERI 2010	Total Employer Cost	Increase over Prior Year	Unfunded Actuarial Accrued Liability
2021	\$21,722,060	\$44,863,868	\$1,548,801	\$303,661	\$5,764	\$68,444,154		\$898,566,864
2022	23,466,626	49,846,133	1,618,497	317,326	5,764	75,254,346	9.95%	919,708,043
2023	24,130,458	56,588,761	1,691,329	331,605	-	82,742,153	9.95%	937,305,798
2024	24,817,524	64,043,507	1,767,439	346,528	-	90,974,998	9.95%	949,297,703
2025	25,528,638	72,289,277	1,846,974	362,121	-	100,027,010	9.95%	954,519,557
2026	26,264,641	81,406,552	1,930,087	378,417	-	109,979,697	9.95%	951,643,404
2027	26,026,403	92,483,886	2,016,942	395,446	-	120,922,677	9.95%	939,157,521
2028	26,814,828	103,618,709	2,107,704	413,242	-	132,954,483	9.95%	914,325,350
2029	27,630,847	118,552,606	-	-	-	146,183,453	9.95%	876,139,068
2030	28,475,427	132,253,281	-	-	-	160,728,708	9.95%	822,385,561
2031	29,349,566	143,836,978	-	-	-	173,186,544	7.75%	750,562,039
2032	30,254,301	149,590,457	-	-	-	179,844,758	3.84%	661,442,864
2033	31,190,701	155,574,075	-	-	-	186,764,776	3.85%	559,644,586
2034	32,159,876	161,797,038	-	-	-	193,956,914	3.85%	443,962,794
2035	33,162,973	168,268,919	-	-	-	201,431,892	3.85%	313,091,560
2036	34,201,177	174,999,675	-	-	-	209,200,852	3.86%	165,615,302
2037	35,275,718	-	-	-	-	35,275,718	-83.14%	-
2038	36,387,868	-	-	-	-	36,387,868	3.15%	-
2039	37,538,942	-	-	-	-	37,538,942	3.16%	-
2040	38,730,305	-	-	-	-	38,730,305	3.17%	-
2041	39,963,366	-	-	-	-	39,963,366	3.18%	-
2042	41,239,585	-	-	-	-	41,239,585	3.19%	-
2043	42,560,470	-	-	-	-	42,560,470	3.20%	-
2044	43,927,587	-	-	-	-	43,927,587	3.21%	-
2045	45,342,553	-	-	-	-	45,342,553	3.22%	-
2046	46,807,042	-	-	-	-	46,807,042	3.23%	-
2047	48,322,788	-	-	-	-	48,322,788	3.24%	-
2048	49,891,586	-	-	-	-	49,891,586	3.25%	-
2049	51,515,291	-	-	-	-	51,515,291	3.25%	-
2050	53,195,826	-	-	-	-	53,195,826	3.26%	-

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Exhibit 3.2 - 30-Year Forecast of Cash Flow

Calendar Year	Market Value of Assets, BOY	Benefit Payments	Employee Contributions	Employer Contributions	Investment Return	Market Value of Assets, EOY
2020	\$801,451,132	\$121,849,804	\$31,796,971	\$64,773,829	\$63,649,527	\$839,821,655
2021	839,821,655	101,430,261	32,909,865	70,270,159	67,936,612	909,508,030
2022	909,508,030	107,496,253	34,061,710	78,305,098	73,719,049	988,097,634
2023	988,097,634	113,998,634	35,253,870	86,096,455	80,148,950	1,075,598,275
2024	1,075,598,275	120,247,362	36,487,755	94,663,052	87,333,555	1,173,835,275
2025	1,173,835,275	126,604,176	37,764,826	104,082,025	95,403,522	1,284,481,472
2026	1,284,481,472	133,063,087	39,086,595	115,384,562	104,566,074	1,410,455,616
2027	1,410,455,616	139,645,120	40,454,626	125,824,786	114,833,685	1,551,923,593
2028	1,551,923,593	146,219,363	41,870,538	138,344,352	126,449,629	1,712,368,749
2029	1,712,368,749	152,596,778	43,336,007	152,109,616	139,624,570	1,894,842,164
2030	1,894,842,164	158,878,857	44,852,767	163,899,400	154,341,424	2,099,056,898
2031	2,099,056,898	166,028,406	46,422,614	170,200,566	170,269,724	2,319,921,396
2032	2,319,921,396	173,499,684	48,047,405	176,749,498	187,481,557	2,558,700,172
2033	2,558,700,172	181,307,170	49,729,064	183,555,957	206,073,951	2,816,751,974
2034	2,816,751,974	189,465,993	51,469,581	190,630,088	226,151,154	3,095,536,804
2035	3,095,536,804	197,991,963	53,271,016	197,982,438	247,825,163	3,396,623,458
2036	3,396,623,458	206,901,601	55,135,502	33,384,054	258,039,955	3,536,281,368
2037	3,536,281,368	216,212,173	57,065,245	34,436,565	268,566,121	3,680,137,126
2038	3,680,137,126	225,941,721	59,062,529	35,525,913	279,404,046	3,828,187,893
2039	3,828,187,893	236,109,098	61,129,718	36,653,389	290,553,011	3,980,414,913
2040	3,980,414,913	246,734,007	63,269,258	37,820,327	302,011,054	4,136,781,545
2041	4,136,781,545	257,837,037	65,483,682	39,028,108	313,774,818	4,297,231,116
2042	4,297,231,116	269,439,704	67,775,611	40,278,161	325,839,386	4,461,684,570
2043	4,461,684,570	281,564,491	70,147,757	41,571,966	338,198,100	4,630,037,902
2044	4,630,037,902	294,234,893	72,602,928	42,911,054	350,842,361	4,802,159,352
2045	4,802,159,352	307,475,463	75,144,030	44,297,010	363,761,415	4,977,886,344
2046	4,977,886,344	321,311,859	77,774,071	45,731,474	376,942,119	5,157,022,149
2047	5,157,022,149	335,770,893	80,496,163	47,216,145	390,368,680	5,339,332,244
2048	5,339,332,244	350,880,583	83,313,529	48,752,779	404,022,375	5,524,540,344
2049	5,524,540,344	366,670,209	86,229,503	50,343,195	417,881,251	5,712,324,084

SECTION 3 - CHAPTER 32 OF M.G.L. APPROPRIATIONS

Forecast Notes

Exhibit 3.1:

- ◆ The Total Normal Cost is expected to increase 3.5% per year.
- ◆ The Unfunded Actuarial Accrued Liability ("UAL") is computed as of January 1 of each year assuming no future gains or losses.
- ◆ The Amortization Payment of UAL is an increasing payment at 4% paid over 16 years through 2036.
- ◆ The Amortization Payment of the Early Retirement Incentive Plan (2002) is an increasing payment at 4.5% paid over 8 year(s) through 2028.
- ◆ The Amortization Payment of the Early Retirement Incentive Plan (2003) is an increasing payment at 4.5% paid over 8 year(s) through 2028.
- ◆ The Amortization Payment of the Early Retirement Incentive Plan (2010) is a level payment to be paid over 2 years through 2022.
- ◆ Net 3(8)(c) transfers are a level dollar amount based on the net transfers expected to be paid by the Worcester Regional Retirement Board during the current year offset by the amount received during the same period. For this valuation, we assumed net 3(8)(c) transfers of \$4,500,000 for FY2022 through FY2026, and \$3,500,000 thereafter.
- ◆ Total Employer Cost is the sum of the Employer Normal Cost, net 3(8)(c) transfers and the Amortization of the UAL, all computed as of January 1 of each year and adjusted for semi-annual payments made on July 1 and January 1.
- ◆ For fiscal year 2021, we show the actual appropriation developed under the previous funding schedule of \$68,444,154. For fiscal years 2022 and later, the Board has selected a funding schedule that fully amortizes the unfunded actuarial accrued liability by 2036, with annual employer costs limited to increases of 9.95% over the prior year.

Exhibit 3.2:

- ◆ Expected benefit payments include payments expected to be made to retired members, beneficiaries, disabled members and active members expected to retire. In addition, expected benefit payments include distribution of the annuity savings fund attributed to inactive members.
- ◆ Benefit payments exclude cost-of-living increases granted to members in pay status between 1982 and 1997. In addition, benefit payments are as expected for the first ten years of the forecast, then increase by the greater of 4.5% per year thereafter or the expected future payments for the current population projected by our computer model.
- ◆ Calendar year cash flow entries are developed as of each January 1.

SECTION 4 - DISCLOSURES

4.1 - GASB 67 and GASB 68 Disclosures

In June 2012, the GASB approved two related Statements that significantly changed the way pension plans and governments account and report pension liabilities. Effective for plans with fiscal years beginning after June 15, 2013, GASB Statement No. 67, *Financial Reporting for Pension Plans*, replaced the requirements of Statement No. 25 and effective for employers with fiscal years beginning after June 15, 2014, GASB Statement No. 68, *Accounting and Financial Reporting for Pensions*, replaced the requirements of Statement No. 27.

The pension standards reflect changes from those previously in place regarding how governments calculate total pension liability and pension expense. Further, the standards contain requirements for disclosing information in the notes to financial statements and presenting required supplementary information following the notes.

GASB 67 requires defined benefit pension plans, such as the Worcester Regional Retirement System, to present a statement of fiduciary net position (pension plan assets) and a statement of changes in fiduciary net position. Further, the statement requires that notes to financial statements include descriptive information such as the types of benefits provided, the classes of plan members covered and the composition of the pension plan's retirement board. Finally, GASB 67 requires pension plans to present in required supplementary information the sources of the changes in the net pension liability and information about the actuarially determined contributions compared with the actual contributions made to the plan and related ratios.

GASB 67 and GASB 68 require projected benefit payments be discounted to their actuarial present value using the single rate that reflects:

- (1) a long-term expected rate of return on pension plan investments *to the extent that the pension plan's assets are sufficient to pay benefits and pension plan assets are expected to be invested using a strategy to achieve that return* and
- (2) a tax-exempt, high-quality municipal bond rate *to the extent that the conditions for use of the long-term expected rate of return are not met.*

GASB 68 establishes standards for measuring and recognizing liabilities, deferred outflows of resources, deferred inflows of resources and pension expense by state and local governments.

The effective date for GASB 67 is for plan years beginning after June 15, 2013, which is the fiscal year ending December 31, 2014 for the Worcester Regional Retirement System. The effective date for GASB 68 is for employers' fiscal years beginning after June 15, 2014. The GASB report, submitted under separate cover and prepared as of December 31, 2019 (the measurement date), presents information to assist the Worcester Regional Retirement Board in providing the required information under GASB 68 to participating employers.

SECTION 4 - DISCLOSURES

4.2 - PERAC Disclosure Information

The most recent actuarial valuation of the System was prepared by KMS Actuaries, LLC as of January 1, 2020.

Normal Cost - Employees	\$31,796,971	9.6% of payroll
Normal Cost - Employers	\$17,342,550	5.2% of payroll
Actuarial Liability - Active Members	\$767,728,013	46% of total AAL
Actuarial Liability - Retired and Inactive Members	908,760,613	54% of total AAL
Total Actuarial Liability (AAL)	<u>\$1,676,488,626</u>	
System Assets	\$777,921,762	
Unfunded Actuarial Accrued Liability	\$898,566,864	
Funded Status		46.4%

Principal actuarial assumptions used in the valuation:

Investment Return		7.65%
Rate of Salary Increase	Based on service, 6% graded down to 4.25% for Group 1 Based on service, 7% graded down to 4.75% for Group 4	

SECTION 4 - DISCLOSURES

4.3 - Risk Measures

The Worcester Regional Retirement System is subject to certain risks that could affect the plan's future financial condition. Here we identify the primary risks to the System, provide some background information about those risks, and provide an assessment of those risks in accordance with Actuarial Standards of Practice (ASOP) 51.

Risk is the potential of actual future measurements deviating from expected future measurements resulting from actual future experience deviating from actuarially assumed experience. Examples of potential risks that may be reasonably anticipated to significantly affect the future financial condition of the plan include the following:

- ◆ **Investment Risk** - the potential that investment returns will be different than expected.
- ◆ **Asset/Liability Mismatch Risk** - the potential that changes in asset values are not matched by changes in the value of liabilities.
- ◆ **Interest Rate Risk** - the potential that interest rates will be different than expected.
- ◆ **Longevity and Other Demographic Risks** - the potential that mortality or other demographic experience will be different than expected.
- ◆ **Contribution Risk** - the potential of actual future contributions deviating from expected future contributions. For example, that actual contributions are not made in accordance with the plan's funding policy, that other anticipated payments to the plan are not made, or that material changes occur in the anticipated number of covered employees, covered payroll, or other relevant contribution base.

We have provided several risk measures in this section that we believe are most significant for the plan. However, we believe that a more rigorous assessment of risk would be beneficial to the Board to understand the risks identified above, such as:

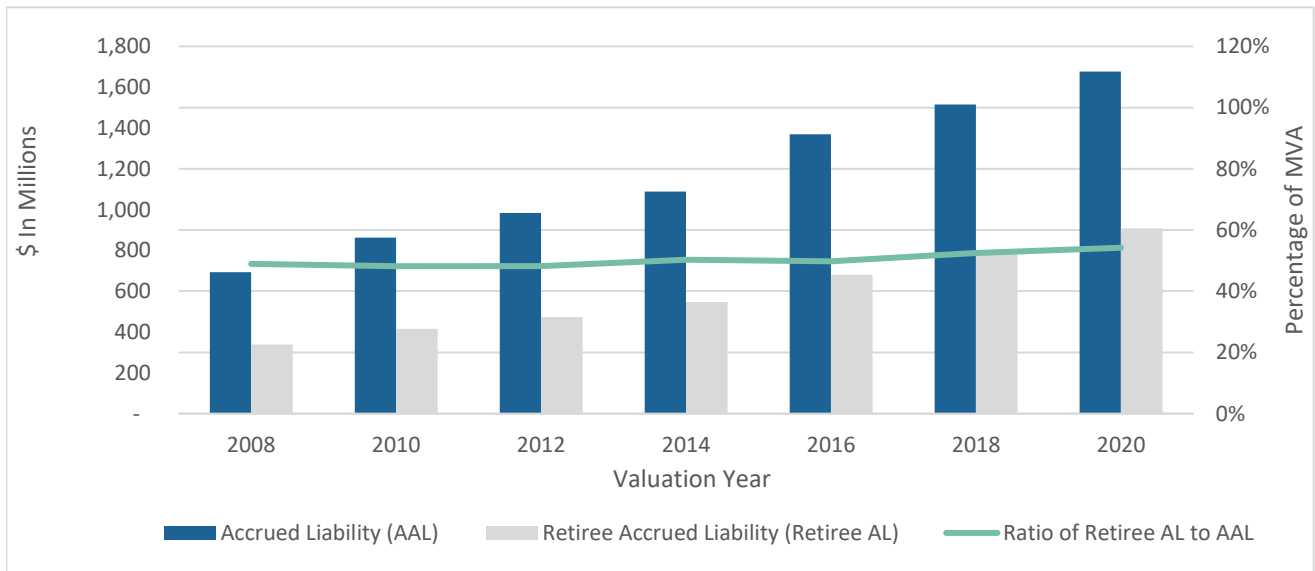
- ◆ **Scenario Test** - a process for assessing the impact of one possible event, or several simultaneous or sequentially occurring possible events, on a plan's financial condition.
- ◆ **Sensitivity Test** - a process for assessing the impact of a change in an actuarial assumption on an actuarial measurement.
- ◆ **Stochastic Modeling** - a process for generating numerous potential outcomes by allowing for random variations in one or more inputs over time for the purpose of assessing the distribution of those outcomes.
- ◆ **Stress Test** - a process for assessing the impact of adverse changes in one or relatively few factors affecting a plan's financial condition.

SECTION 4 - DISCLOSURES

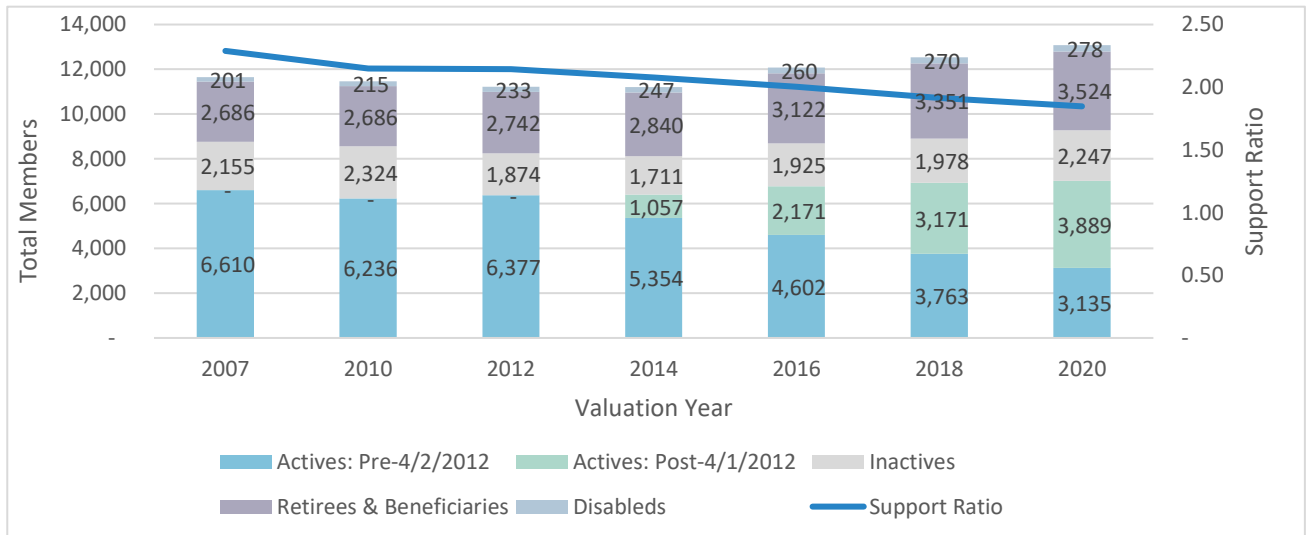
4.3 - Risk Measures

Maturity Measures

As retirement systems mature they become much more sensitive to risks. This is because a higher proportion of the actuarial liability is attributable to participants who are no longer active. Plan maturity measures are helpful in understanding the risks associated with a plan. One such maturity measure is the ratio of the system's retiree liability to its total liability. A retirement system in its infancy will have a very low ratio of retiree liability to total liability. As the system matures, the ratio starts increasing. A mature plan will often have a ratio above 60%. For the Worcester Regional Retirement System and other retirement systems in the United States these ratios have been steadily increasing in recent years.



Another maturity measure is the ratio of actives to retirees, or support ratio. A retirement system in its infancy will have a very high ratio of active to retired members. As the system matures, and members retire, the support ratio starts declining. A mature system will often have a support ratio near or below one.



SECTION 4 - DISCLOSURES

4.3 - Risk Measures

Volatility Indices

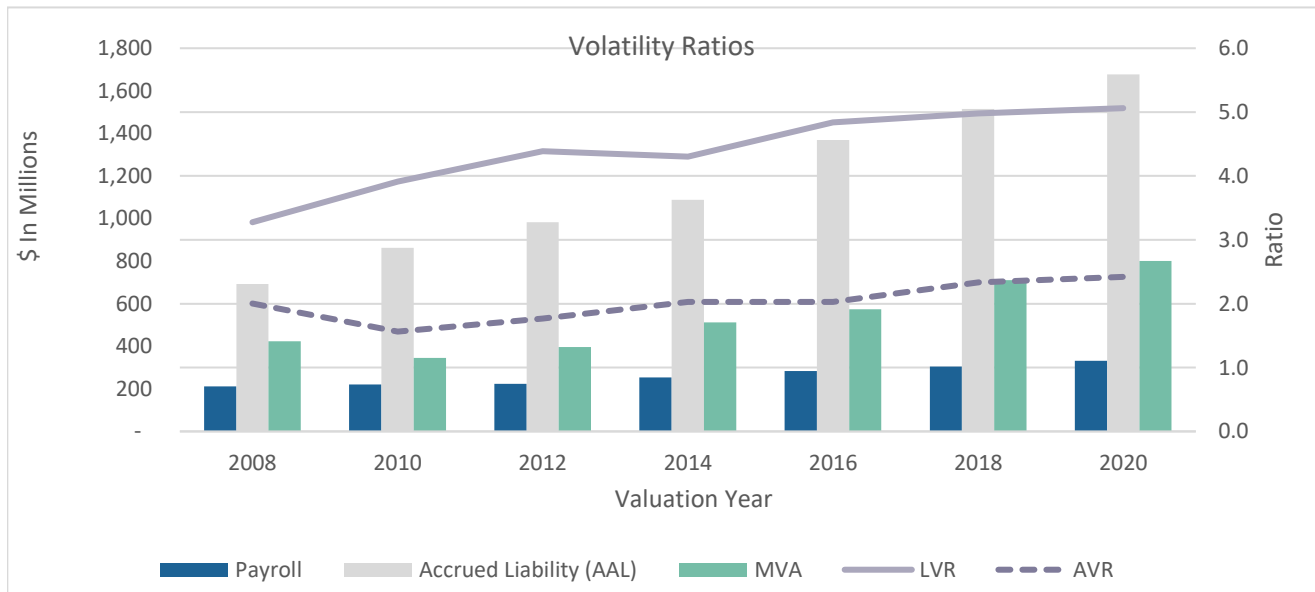
Volatility indices are measures of the relative sensitivity of employer contributions to changes in assets or liabilities. Below we present two such indices - the Asset Volatility Ratio (AVR) and the Liability Volatility Ratio (LVR):

Asset Volatility Ratio (AVR)

The Asset Volatility Ratio (AVR) is the ratio of the Market Value of Assets (MVA) to Payroll. Systems with a higher AVR experience more volatile employer contributions (as a percentage of payroll) due to investment return. This ratio indicates a measure of the system's current contribution volatility. The AVR increases over time but generally tends to stabilize as the system matures.

Liability Volatility Ratio (LVR)

The Liability Volatility Ratio (LVR) is the ratio of the Actuarial Accrued Liability (AAL) to Payroll. Due to the investment return assumption, systems with a higher LVR experience more volatile employer contributions (as a percentage of payroll). This ratio indicates a longer-term potential for contribution volatility. The AVR, described above, will tend to move close to the LVR as the system matures.

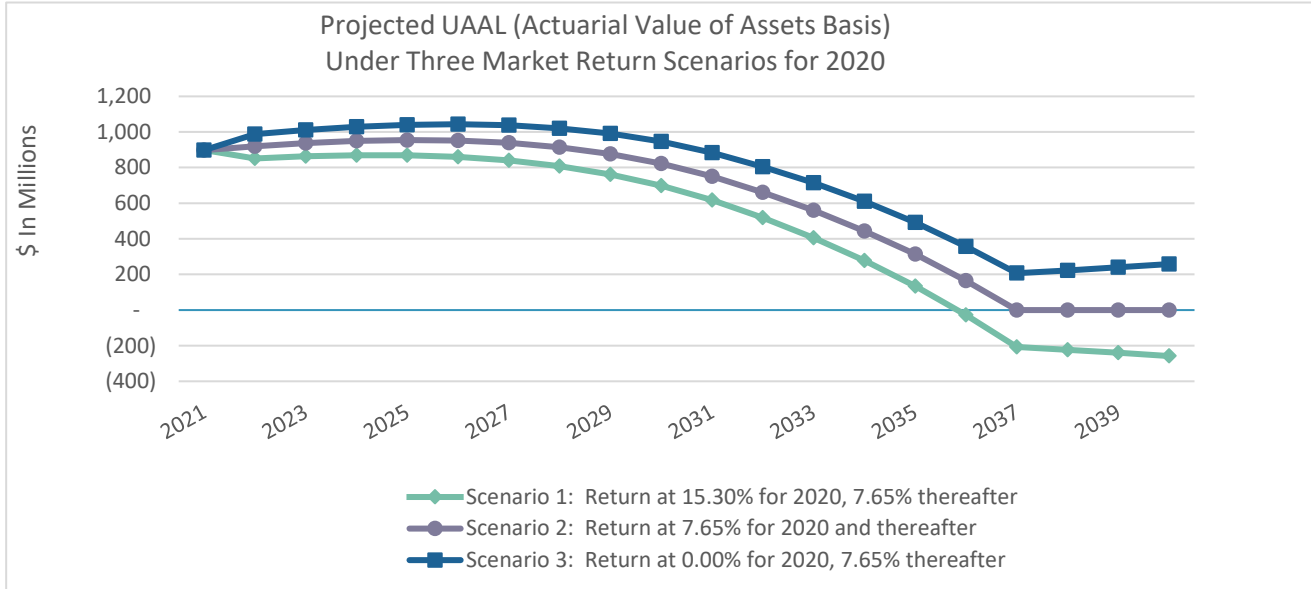


SECTION 4 - DISCLOSURES

4.3 - Risk Measures

Market Return Scenarios

Below we illustrate the projected effect on funding levels of a single year of investment return above or below the assumed investment return. Scenario 1 assumes a one-year return of 2 times the assumed return and the expected return thereafter, Scenario 2 assumes assets earn the expected return every year and Scenario 3 assumes a one-year return of 0% and the expected return thereafter.



Sensitivity Analysis

The following presents the Actuarial Accrued Liability and Funded Status calculated using the investment return rate of 7.65%, as well as what the Actuarial Accrued Liability and Funded Status would be if it were calculated using an investment return rate 1-percentage point lower (6.65%) or 1-percentage point higher (8.65%) than the assumed investment return rate:

	1% Decrease (6.65%)	Current Investment Return Rate (7.65%)	1% Increase (8.65%)
Actuarial Accrued Liability	\$1,869,931,060	\$1,676,488,626	\$1,513,005,493
% Change	12%		-10%
Actuarial Value of Assets	\$777,921,762	\$777,921,762	\$777,921,762
Unfunded Actuarial Accrued Liability	1,092,009,298	898,566,864	735,083,731
% Change	22%	N/A	-18%
Funded Status	41.6%	46.4%	51.4%

SECTION 4 - DISCLOSURES

4.3 - Risk Measures

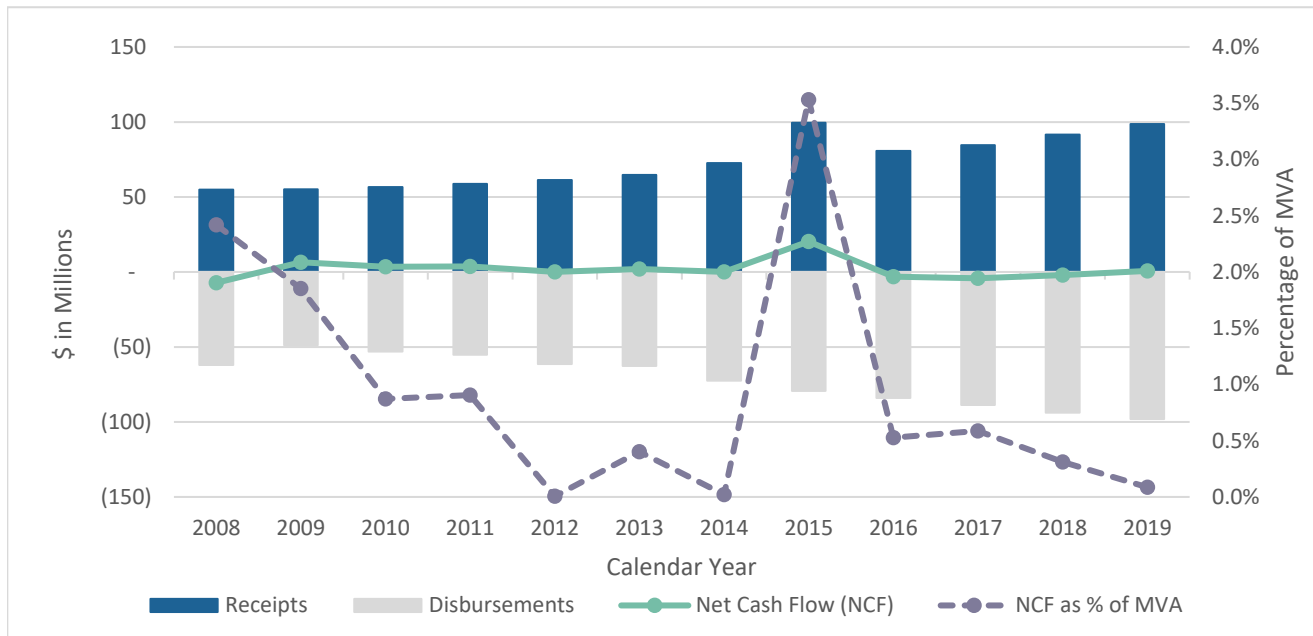
Duration

Duration is another measure that is used to describe how the present value of a cash flow series changes when small changes are made to the underlying interest rates. The duration of the Worcester Regional Retirement System is 11, and this represents an approximate percentage change in the Actuarial Accrued Liability for each 1% change to the investment return rate.

Net Cash Flow (NCF)

Net cash flow (NCF) during a year is the difference between contributions, both employer and employee, paid into the System and benefit payments and expenses paid from the System. If the level of benefit payments plus expenses is greater than contributions, then the System has negative NCF. Mature plans generally have a negative NCF as the number of retirees grows. When a System has negative NCF, then additional cash from existing assets are needed to pay the pension benefits.

Historical NCF since 2008 is shown in the next graph. Blue bars indicate contributions, from employees and employers, and grey bars show benefit payments and administrative expenses. The NCF is represented by the green line. The dashed purple line (which corresponds to the right-hand axis) provides the NCF as a percentage of the Market Value of Assets. As of December 31, 2019, the NCF was positive \$0.7 million, which represents 0.1% of the Market Value of Assets. The NCF falls within the range of 0.0% to 3.5% of total assets over the 12-year period.



SECTION 5 - SUMMARY OF PLAN PROVISIONS

Administration There are 104 contributory retirement systems for public employees in Massachusetts. Each system is governed by a retirement board and all boards, although operating independently, are governed by Chapter 32 of the Massachusetts General Laws and other applicable statutes. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

Participation Participation is mandatory for all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by the local retirement board, and approved by PERAC. Membership is optional for certain elected officials.

Membership Groups There are four membership groups in the Retirement System:

Group 1	General employees, including clerical, administrative, technical and all other employees not otherwise classified.
Group 2	Certain specified hazardous duty positions.
Group 3	State police officers and inspectors.
Group 4	Local police officers, firefighters and other specified hazardous positions.

For members in more than one group, participation will be proportional.

Member Contributions Member contributions vary depending on the most recent date of membership:

Prior to 1975	5% of Salary
1975 - 1983	7% of Salary
1984 - June 30, 1996	8% of Salary
July 1, 1996 - present	9% of Salary
1979 - present	An additional 2% of Salary in excess of \$30,000.
Group 1 members hired on or after April 2, 2012	6% of Salary with 30 or more years of creditable service.

Rate of Interest Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least ten financial institutions.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

- Retirement Age** The mandatory retirement age for some Group 2 and Group 4 members is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for members in Group 1.
- Salary** Gross regular compensation. This does not include bonuses, overtime, severance pay, unused sick leave credit or other similar compensation.
- Average Salary**
- Membership before April 2, 2012** ♦ Average annual rate of regular compensation received during the three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.
- Membership on or after April 2, 2012** ♦ Average annual rate of regular compensation received during the five consecutive years that produce the highest average, or, if greater, during the last five years (whether or not consecutive) preceding retirement.
- Creditable Service** The period during which a member contributes to the retirement system plus certain periods of military service and “purchased” service.
- Benefit Rate** The benefit rate varies with the member's retirement age, Group, membership date and years of creditable service at retirement. Each year a member retires prior to the age at which the 2.5% maximum benefit rate applies, a reduction is applied to each year of age under the maximum age. The maximum age and reduction for each Group and membership date is as follows:

	Group 1	Group 2	Group 4
2.5% for Membership before April 2, 2012:			
Maximum age:	65	60	55
Reduction:	0.1%	0.1%	0.1%
2.5% for Membership on or after April 2, 2012 (less than 30 years of service):			
Maximum age:	67	62	57
Reduction:	0.15%	0.15%	0.15%
2.5% for Membership on or after April 2, 2012 (30+ years of service):			
Maximum age:	67	62	57
Reduction:	0.125%	0.125%	0.125%

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Superannuation Retirement

Eligibility if membership before April 2, 2012	<ul style="list-style-type: none">♦ completion of 20 years of Creditable Service, or♦ attainment of age 55 if hired prior to 1978, or♦ attainment of age 55 with 10 years of Creditable Service, if hired after 1978.
Eligibility if membership on or after April 2, 2012	<ul style="list-style-type: none">♦ attainment of age 60 with 10 years of Creditable Service if classified in Group 1♦ attainment of age 55 with 10 years of Creditable Service if classified in Group 2♦ attainment of age 55 if classified in Group 4
Benefit Amount	Product of the member's Benefit Rate, Average Salary and Creditable Service.
Maximum Benefit	80% of the member's Average Salary.
Veteran's Benefit	Additional benefit of \$15 per year of Creditable Service, up to a maximum of \$300.

Deferred Vested

Eligibility	<ul style="list-style-type: none">♦ completion of ten or more years of Creditable Service.♦ elected officials hired prior to 1978, completion of six years of Creditable Service.
Benefit Amount	Accrued benefit payable commencing at age 55, or the completion of 20 years of Creditable Service, or may be deferred until later at the participant's option.

Withdrawal of Contributions

- Contributions may be withdrawn upon termination of employment.
- ♦ Members hired on or after January 1, 1984 who terminate with less than ten years of Creditable Service receive contributions plus interest on the Annuity Savings Account at an annual rate of 3%.
 - ♦ All other withdrawals receive contributions plus 100% of the regular interest that has accrued to the Annuity Savings Account.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Ordinary Disability Retirement	Eligibility	Non-job related disability after completion of ten years of Creditable Service.
	Benefit Amount for Group 1 membership before April 2, 2012 or Group 2 or Group 4	Superannuation benefit determined if the member is age 55, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
	Benefit Amount for Group 1 membership on or after April 2, 2012	Superannuation benefit determined if the member is age 60, up to a maximum of 80% of Average Salary over three years. If the member is a veteran, 50% of final rate of salary (final year) plus an annuity based on the accumulated member contributions plus credited interest, up to a maximum of 80% of Average Salary over five years.
Accidental Disability Retirement	Eligibility	Disabled as a result of an accident in the performance of duties. There is no minimum age or service requirement.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of Creditable Service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$952.32 per year for each child until age 18 (or age 22 if a full-time student).
Non-Occupational Death	Eligibility	For members with at least two years of creditable service who die while in active service, but not due to occupational injury.
	Benefit Amount	Benefit as if Option C had been elected. Minimum benefit of \$250 per month for surviving spouse, \$120 per month for first child and \$90 per month for each additional child.

SECTION 5 - SUMMARY OF PLAN PROVISIONS

Accidental Death	Eligibility	For members who die as a result of an occupational injury.
	Benefit Amount	72% of Salary plus an annuity based on accumulated member contributions plus credited interest.
	Maximum Benefit	100% of Salary if hired before January 1, 1988, otherwise 75% of Salary.
	Veteran's Benefit	Additional allowance of \$15 per year of creditable service, up to a maximum of \$300.
	Supplemental Dependent Allowance	Additional allowance of \$952.32 per year for each child until age 18 (or age 22 if a full-time student).

Cost-of-Living Adjustment (COLA) In accordance with the adoption of Chapter 17 of the Acts of 1997, the granting of a Cost-of-Living Adjustment will be determined by an annual vote by the Retirement Board. The amount of increase will be based upon the Consumer Price Index, limited to a maximum of 3.0%, beginning on July 1. All retirees, disabled retirees and beneficiaries who have been receiving benefit payments for at least one year as of July 1 are eligible for the adjustment. The maximum amount of pension benefit subject to a COLA is \$16,000. All COLAs granted to members after 1981 and prior to July 1, 1998 are deemed to be an obligation of the Commonwealth of Massachusetts and are not the liability of the Retirement System.

Optional Forms of Payment A member may elect to receive his or her retirement allowance, payable in monthly installments, in one of three forms of payment:

- ◆ Option A – Total annual allowance commencing at retirement and terminating at member's death.
- ◆ Option B – A reduced annual allowance commencing at retirement with death benefit equal to excess of member contributions plus credited interest to retirement over annuity benefit paid to member.
- ◆ Option C – A reduced annual allowance commencing at retirement with 66⅔% of benefit continued to designated beneficiary upon death of member. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable increases based on the factor used to determine the Option C benefit at retirement.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Valuation Date	January 1, 2020
Investment Return	<p>7.65% per year. Previously, 7.75% per year.</p> <p>The investment return assumption is a long-term assumption based on capital market expectations by asset class, historical returns and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach and using the target asset allocation, expected returns by asset class and risk analysis to determine a long-term expected average annual rate of return.</p>
Annuity Savings Fund Interest Rate	2.00% per year
Amortization Method	<p><i>Unfunded Actuarial Accrued Liability (UAL):</i></p> <p>Increasing dollar amount at 4% to reduce the Unfunded Actuarial Accrued Liability to zero on or before June 30, 2036.</p> <p><i>Early Retirement Incentive Program (ERI) for 2002:</i></p> <p>Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability attributable to the 2002 ERI to zero on or before June 30, 2028.</p> <p><i>Early Retirement Incentive Programs (ERI) for 2003:</i></p> <p>Increasing dollar amount at 4.5% to reduce the Unfunded Actuarial Accrued Liability attributable to the 2003 ERI to zero on or before June 30, 2028.</p> <p><i>Early Retirement Incentive Programs (ERI) for 2010:</i></p> <p>Level dollar amount to reduce the Unfunded Actuarial Accrued Liability attributable to the 2010 ERI to zero on or before June 30, 2022.</p>

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Salary Scale

The assumed annual rates for salary increases including longevity are illustrated by the following rates:

Years of Service	Groups 1 and 2	Group 4
0	6.00%	7.00%
1	5.50%	6.50%
2	5.50%	6.00%
3	5.25%	5.75%
4	5.25%	5.25%
5	4.75%	5.25%
6	4.75%	4.75%
7	4.50%	4.75%
8	4.50%	4.75%
9+	4.25%	4.75%

The salary scale assumption is a long-term estimate derived from historical data, current and recent market expectations and professional judgment.

Cost-of-Living Allowance

Cost-of-Living Allowances (COLA) are assumed to be 3% of the pension amount, capped at \$480 per year.

Mortality Rates

RP-2014 Blue Collar Mortality Table with full generational mortality improvement using Scale MP-2018. For disabled members, RP-2014 Blue Collar Mortality Table set forward one year with full generational mortality improvement using Scale MP-2018.

General Employees: 55% of deaths are job-related.

Police and Fire: 90% of deaths are job-related.

PERAC completed a local system retiree mortality study in 2019 and selected the RP-2014 Blue Collar Mortality Table with full generational mortality improvement using Scale MP-2018. The underlying tables with generational mortality improvement selected reasonably reflect the mortality experience of the Board as of the valuation date based on historical and current demographic data as well as professional judgement.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Turnover Rates

Illustrative turnover rates are shown below:

Creditable Service	Groups 1 and 2	Group 4
0	0.1500	0.0150
10	0.0540	0.0150
20	0.0200	0.0000
30	0.0000	0.0000

Disability Rates

Illustrative disability rates are shown below:

Attained Age	Groups 1 and 2	Group 4
20	0.0001	0.0010
30	0.0003	0.0030
40	0.0010	0.0030
50	0.0019	0.0125
60	0.0028	0.0085

General Employees: 55% of disabilities are accidental and 45% are ordinary.

Police and Fire: 90% of disabilities are accidental and 10% are ordinary.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Retirement Rates

Illustrative retirement rates are shown below:

Attained Age	Groups 1 and 2		Group 4
	Male	Female	Male & Female
50	0.0100	0.0150	0.0200
51	0.0100	0.0150	0.0200
52	0.0100	0.0200	0.0200
53	0.0100	0.0250	0.0500
54	0.0200	0.0250	0.0750
55	0.0200	0.0550	0.1500
56	0.0250	0.0650	0.1000
57	0.0250	0.0650	0.1000
58	0.0500	0.0650	0.1000
59	0.0650	0.0650	0.1500
60	0.1200	0.0500	0.2000
61	0.2000	0.1300	0.2000
62	0.3000	0.1500	0.2500
63	0.2500	0.1250	0.2500
64	0.2200	0.1800	0.3000
65	0.4000	0.1500	1.0000
66	0.2500	0.2000	1.0000
67	0.2500	0.2000	1.0000
68	0.3000	0.2500	1.0000
69	0.3000	0.2000	1.0000
70	1.0000	1.0000	1.0000

The turnover, disability and retirement rates are based on PERAC's most recent experience analysis of local retirement systems which reviewed age, gender and job group. The assumptions reflect this analysis as well as professional judgment.

Actuarial Cost Method

Individual Entry Age Normal.

Actuarial Asset Method

The Actuarial Value of Assets is the market value of assets as of the valuation date reduced by the sum of:

- a) 80% of gains and losses of the prior year,
- b) 60% of gains and losses of the second prior year,
- c) 40% of gains and losses of the third prior year, and
- d) 20% of gains and losses of the fourth prior year.

Investment gains and losses are determined by the excess or deficiency of the expected return over the actual return on the market value. The actuarial valuation of assets is further constrained to be not less than 80% or more than 120% of market value.

SECTION 6 - ACTUARIAL ASSUMPTIONS AND METHODS

Census Data	Census data as of the valuation date were submitted by the Retirement Board.
Asset Data	Asset information is reported annually to the Public Employee Retirement Administration Commission by the Worcester Regional Retirement Board.
Dependents	80% of all members will be survived by a spouse. Age assumption for spouses is that males are assumed to be three years older than females.
Net Section 3(8)(c) Transfers	Reimbursements paid to and received from other retirement systems for that portion of a retiree's pension that is based on service earned in another retirement system. Net 3(8)(c) transfers are assumed to be \$4,500,000 for FY2022 through FY2026 and \$3,500,000 per year thereafter.
Administrative Expenses	<p>The anticipated administrative expenses for the fiscal year. For Fiscal Year 2022, the administrative expenses were assumed to be \$1,200,000 and are anticipated to increase 3.5% per year. Previously, \$1,100,000.</p> <p>The administrative expense assumption is based on information relating to the System's administrative expenses provided by the Retirement Board.</p>

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.1 - Summary of Census Data as of January 1, 2020

Census data as of December 31, 2019 was provided to us by the Retirement Board. We performed edits on the data to ensure that it is reasonable and complete and made certain assumptions regarding any missing or invalid data so that results are not materially affected. Presented on the following pages are summaries of the demographic profile of active members (Exhibit 7.2) and retired plan members and beneficiaries and disabled plan members (Exhibit 7.3). Below, we present a comparison of the census data from the current and prior valuations:

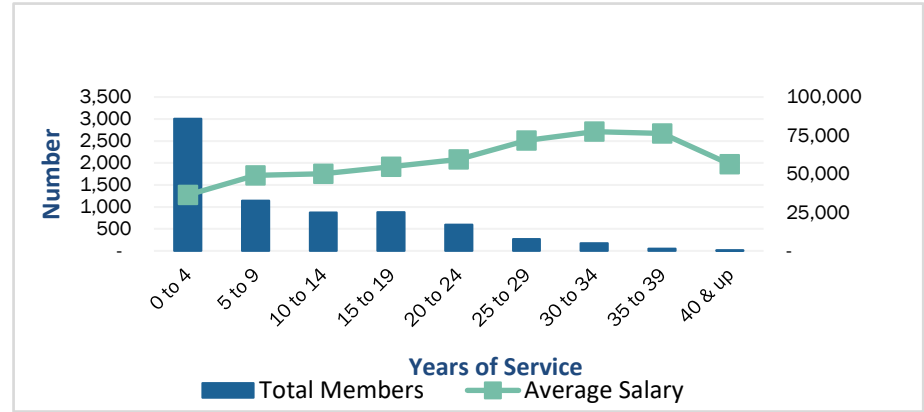
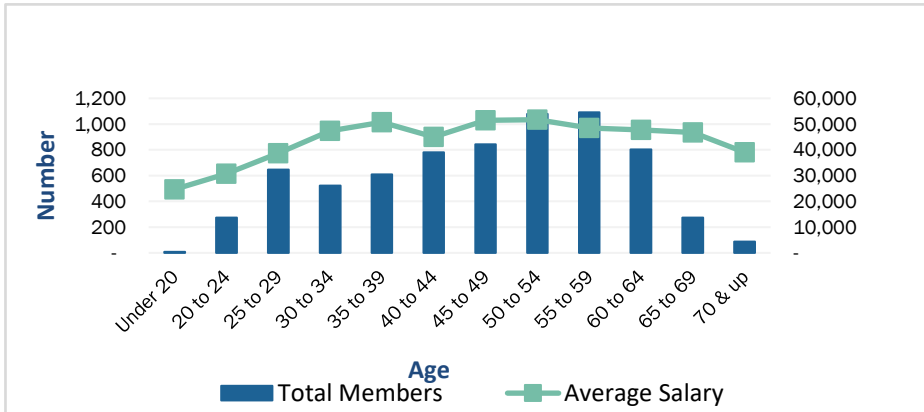
Valuation Date	January 1, 2020	January 1, 2018	% Change
Census Data			
Active Members	7,024	6,934	1.3%
Average Age	47.3	47.5	(0.4%)
Average Service	9.9	10.1	(2.2%)
Valuation Salary	\$331,209,833	\$304,282,620	8.8%
Average Salary	\$47,154	\$43,883	7.5%
Retired Members and Beneficiaries	3,524	3,351	5.2%
Average Age	73.2	73.5	(0.4%)
Total Annual Retirement Allowance	\$77,525,219	\$68,184,912	13.7%
Average Annual Retirement Allowance	\$21,999	\$20,348	8.1%
State Reimbursed COLAs	\$262,882	\$354,170	(25.8%)
Total System-Funded Retirement Allowance	\$77,262,337	\$67,830,742	13.9%
Disabled Members	278	270	3.0%
Average Age	63.8	62.9	1.4%
Total Annual Retirement Allowance	\$9,589,804	\$8,731,339	9.8%
Average Annual Retirement Allowance	\$34,496	\$32,338	6.7%
State Reimbursed COLAs	\$57,372	\$63,992	(10.3%)
Total System-Funded Retirement Allowance	\$9,532,432	\$8,667,347	10.0%
Inactive Members	2,247	1,978	13.6%
Annuity Savings Fund	\$26,500,968	\$18,530,021	43.0%

SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.2 - Active Members by Age and Years of Service as of January 1, 2020

Attained Age	Years of Service									Total	Total Salary	Average Salary
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 & up			
Under 20	9	-	-	-	-	-	-	-	-	9	222,075	24,675
20 to 24	272	1	-	-	-	-	-	-	-	273	8,369,743	30,658
25 to 29	579	64	3	-	-	-	-	-	-	646	24,964,472	38,645
30 to 34	331	141	49	2	-	-	-	-	-	523	24,781,187	47,383
35 to 39	326	121	100	60	3	-	-	-	-	610	30,934,699	50,713
40 to 44	472	121	71	82	35	1	-	-	-	782	35,221,911	45,041
45 to 49	335	166	103	110	108	18	2	1	-	843	43,361,535	51,437
50 to 54	304	222	172	145	96	87	51	2	-	1,079	55,779,340	51,695
55 to 59	216	166	193	235	143	58	61	19	1	1,092	52,965,203	48,503
60 to 64	119	95	127	179	154	63	38	22	7	804	38,337,241	47,683
65 to 69	34	38	47	61	39	31	16	4	4	274	12,795,690	46,700
70 & up	13	8	10	8	21	9	10	5	5	89	3,476,736	39,064
Total	3,010	1,143	875	882	599	267	178	53	17	7,024	331,209,833	47,154
Average Salary	36,304	49,048	50,197	54,799	59,539	71,734	77,500	76,383	56,365			

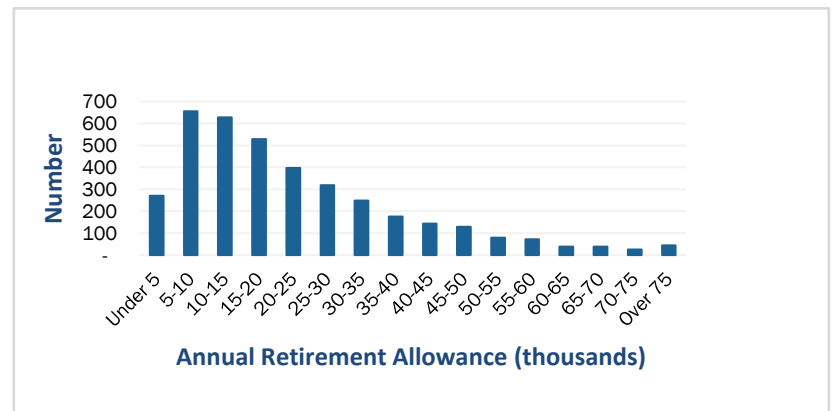
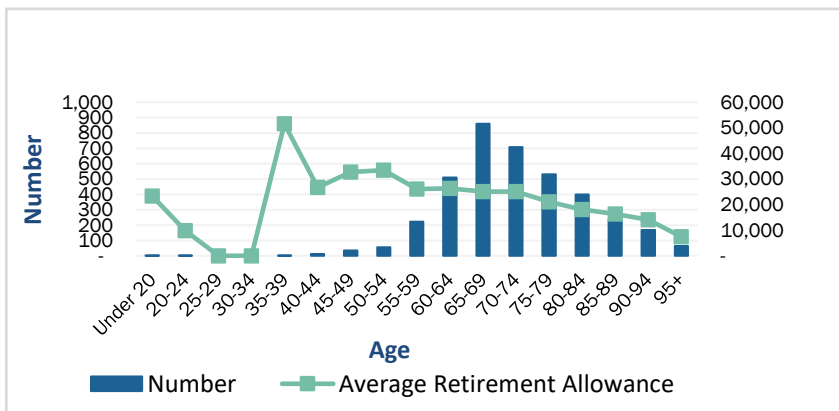
Average Age: 47.3 Average Service: 9.9



SECTION 7 - PLAN MEMBER INFORMATION

Exhibit 7.3 - Annual Retirement Allowances as of January 1, 2020

Attained Age	Service Retirements		Disability Retirements		Beneficiaries	
	Number	Annual Retirement Allowance	Number	Annual Retirement Allowance	Number	Annual Retirement Allowance
Under 20	0	0	0	0	1	23,380
20-24	0	0	0	0	1	9,826
25-29	0	0	0	0	0	0
30-34	0	0	0	0	0	0
35-39	0	0	2	103,067	0	0
40-44	1	13,488	9	276,194	2	31,094
45-49	5	100,132	19	838,058	11	204,882
50-54	19	719,447	29	999,666	8	155,746
55-59	159	3,931,924	44	1,633,695	19	233,847
60-64	424	10,985,983	49	1,773,635	36	665,587
65-69	760	18,834,577	50	1,698,862	49	1,002,273
70-74	635	15,990,845	34	1,115,318	39	651,475
75-79	466	9,865,391	20	628,472	44	707,310
80-84	335	6,282,323	13	302,399	52	636,389
85-89	197	3,345,876	7	178,020	33	347,685
90-94	139	2,018,190	2	42,418	26	297,796
95+	54	422,852	0	0	9	46,901
Total	3,194	72,511,028	278	9,589,804	330	5,014,191
Average Age	73.1		63.8		74.0	
Average Retirement Allowance		22,702		34,496		15,195



SECTION 8 - GLOSSARY OF TERMS

Actuarial Accrued Liability – That portion of the Actuarial Present Value of pension plan benefits which is not provided by future Normal Costs or employee contributions. It is the portion of the Actuarial Present Value attributable to service rendered as of the Valuation Date.

Actuarial Assumptions – Assumptions, based upon past experience or standard tables, used to predict the occurrence of future events affecting the commencement, amount and duration of pension benefits, such as: changes in compensation, mortality, withdrawal, disablement and retirement; rates of investment earnings and asset appreciation or depreciation; and any other relevant items.

Actuarial Cost Method (or Funding Method) – A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the current year (Normal Cost) and the past (Actuarial Accrued Liability).

Actuarial Gain or Loss (or Experience Gain or Loss) – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between the valuation date and the most recent immediately preceding valuation date.

Actuarial Present Value – The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

Amortization Payment – That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

Annual Statement – The statement submitted by the local retirement board to PERAC each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

Annuity Reserve Fund – The fund into which total accumulated Member Contributions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

Annuity Savings Fund – The fund in which Member Contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Assets – The total value of the investments held by the Plan trust that are for the payment of promised benefits. Employer appropriations and Member Contributions, as well as investment earnings, are added to the Plan trust. Benefit payments and other disbursements are withdrawn from the Plan trust. For valuation purposes, assets are usually measured at market value.

Cost of Benefits – The estimated payment from the pension system for benefits for the fiscal year.

Expense Fund – The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

SECTION 8 - GLOSSARY OF TERMS

Funded Ratio – The Actuarial Value of Assets expressed as a percentage of the Actuarial Accrued Liability.

Funding Schedule – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22D and Section 22F of M.G.L. Chapter 32.

GASB – Governmental Accounting Standards Board.

Normal Cost – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits which is expected to accrue in the current fiscal year. The Employee Normal Cost is the amount of the expected Member Contributions for the current fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

Pension Fund – The fund into which appropriation amounts as determined by PERAC are paid and from which pension benefits are paid.

Pension Reserve Fund – The fund which shall be credited with all amounts set aside by a system for the purpose of establishing a reserve to meet future pension liabilities. These amounts would include excess interest earnings.

Present Value of Future Benefits – The actuarial present value of the cost to finance benefits payable in the future, discounted to reflect the expected effects of the time value of money and the probabilities of payment.

Special Fund for Military Service Credit – The fund which is credited with amounts paid by the retirement board equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the retirement board. In the event of retirement or a non-job related death, such amount is transferred to the Annuity Reserve Fund. In the event of termination prior to retirement or death, such amount shall be transferred to the Pension Fund.

Total Pension Liability – The portion of the Actuarial Present Value attributable to past service in accordance with the Entry Age cost method as stipulated by GASB Statement Number 67 (GASB 67).

Unfunded Actuarial Accrued Liability – The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets.

SECTION 9 - MEMBER UNIT FY2022 APPROPRIATION

Unit	Unit Name	Normal Cost	UAL	2002 ERI	2003 ERI	2010 ERI	FYE2022	FYE2021	Increase over	Payment on
							Appropriation	Appropriation	FYE 2021	7/1/2021
010	Ashburnham	374,535	644,636	34,911	-	-	1,054,082	896,957	17.52%	1,035,010
020	Ashburnham-Westminster Regional	286,252	519,961	-	-	-	806,213	739,445	9.03%	791,626
025	Athol	495,577	1,340,188	-	-	-	1,835,765	1,664,418	10.29%	1,802,550
026	Athol Housing Authority	14,255	30,809	-	-	-	45,064	39,237	14.85%	44,249
027	Athol-Royalston Regional School District	185,499	496,985	-	-	-	682,484	633,110	7.80%	670,136
030	Auburn	1,224,974	2,525,285	192,301	29,836	-	3,972,396	3,626,203	9.55%	3,900,522
040	Auburn Housing Authority	25,398	52,075	-	-	-	77,473	70,867	9.32%	76,071
050	Auburn Water District	22,946	91,556	5,723	-	-	120,225	103,840	15.78%	118,050
060	Barre	172,510	236,280	6,296	2,518	-	417,604	364,530	14.56%	410,048
070	Barre Housing Authority	5,690	24,517	-	-	-	30,207	20,935	44.29%	29,660
080	Berlin	193,861	367,725	-	-	-	561,586	543,238	3.38%	551,425
090	Berlin-Boylston Regional	46,940	95,156	-	-	-	142,096	181,595	79.16%	139,525
091	Berlin-Boylston Regional Regionalized	107,052	76,195	-	-	-	183,247	-		179,931
100	Blackstone	280,389	656,768	-	-	-	937,157	945,615	-0.89%	920,201
105	Blackstone Housing Authority	-	18,702	-	-	-	18,702	19,306	-3.13%	18,364
110	Blackstone-Millville Regional	202,606	418,738	-	-	-	621,344	592,754	4.82%	610,102
120	Bolton	219,041	375,465	18,888	-	-	613,394	530,363	15.66%	602,296
130	Boylston	272,635	431,406	14,309	-	-	718,350	736,601	-2.48%	705,353
135	Boylston Water District	4,043	11,020	-	-	-	15,063	13,583	10.90%	14,790
140	Brookfield	131,256	230,457	9,538	-	-	371,251	320,488	15.84%	364,534
150	Charlton	618,019	1,090,519	48,839	-	-	1,757,377	1,519,170	15.68%	1,725,580
160	Cherry Valley-Rochdale Water	8,665	57,874	-	-	-	66,539	62,118	7.12%	65,335
170	Douglas	489,364	784,360	13,734	13,173	-	1,300,631	1,214,620	7.08%	1,277,098
180	Dudley	262,390	694,428	145,941	8,718	-	1,111,477	972,957	14.24%	1,091,367
190	Dudley Housing Authority	5,614	16,914	-	-	-	22,528	17,758	26.86%	22,120
200	Dudley-Charlton Regional	362,835	824,963	44,830	19,567	-	1,252,195	1,151,050	8.79%	1,229,539
210	East Brookfield	70,729	118,182	-	-	-	188,911	172,273	9.66%	185,493
220	Grafton	771,244	1,556,976	44,067	18,986	-	2,391,273	2,113,131	13.16%	2,348,007
230	Grafton Housing Authority	13,857	41,945	-	-	-	55,802	56,940	-2.00%	54,792
240	Hardwick	62,338	145,497	14,500	-	-	222,335	214,848	3.48%	218,312
250	Harvard	376,460	772,669	-	-	-	1,149,129	1,020,125	12.65%	1,128,337

SECTION 9 - MEMBER UNIT FY2022 APPROPRIATION

Unit	Unit Name	Normal Cost	UAL	2002 ERI	2003 ERI	2010 ERI	FYE2022	FYE2021	Increase over	Payment on
							Appropriation	Appropriation	FYE 2021	7/1/2021
260	Hillcrest Water District	205	4,934	-	-	-	5,139	4,069	26.30%	5,046
270	Holden	722,980	1,945,241	72,302	-	-	2,740,523	2,435,654	12.52%	2,690,938
280	Holden Housing Authority	-	23,264	-	-	-	23,264	36,390	-36.07%	22,843
290	Hopedale	453,142	770,713	-	-	-	1,223,855	1,087,492	12.54%	1,201,711
300	Hopedale Housing Authority	-	3,365	-	-	-	3,365	5,723	-41.20%	3,304
310	Hubbardston	137,767	175,440	11,445	4,843	-	329,495	278,671	18.24%	323,533
320	Lancaster	237,601	536,562	-	-	-	774,163	741,603	4.39%	760,156
325	Lancaster Housing Authority	5,572	10,122	-	-	-	15,694	17,401	-9.81%	15,410
327	Lancaster Sewer	2,506	323	-	-	-	2,829	2,213	27.84%	2,778
330	Leicester	420,949	1,104,325	57,421	2,326	-	1,585,021	1,483,415	6.85%	1,556,343
340	Leicester Housing Authority	20,806	39,262	-	-	-	60,068	52,455	14.51%	58,981
350	Leicester Water District	5,474	52,575	-	-	-	58,049	54,106	7.29%	56,999
360	Lunenburg	466,758	1,092,525	-	-	-	1,559,283	1,530,172	1.90%	1,531,070
370	Lunenburg Housing Authority	1,241	1,131	-	-	-	2,372	1,816	30.62%	2,329
380	Lunenburg Water District	(1,093)	67,846	-	-	-	66,753	66,460	0.44%	65,545
390	Mendon	263,114	546,935	9,157	24,603	-	843,809	731,103	15.42%	828,542
400	Mendon-Upton Regional	332,518	593,302	7,631	8,522	-	941,973	871,114	8.13%	924,930
410	Millbury	526,018	1,559,105	155,859	-	-	2,240,982	2,064,960	8.52%	2,200,435
420	Millbury Housing Authority	24,424	83,997	-	6,976	-	115,397	107,298	7.55%	113,309
430	Millville	140,591	75,160	-	-	-	215,751	193,271	11.63%	211,847
440	Narragansett Regional	203,910	344,664	26,899	-	-	575,473	448,945	28.18%	565,061
450	Nashoba Regional	429,876	803,403	-	-	-	1,233,279	1,167,400	5.64%	1,210,965
455	Nashoba Valley Dispatch	26,493	30,714	-	-	-	57,207	42,695	33.99%	56,172
460	New Braintree	14,975	50,879	-	-	-	65,854	64,267	2.47%	64,662
470	Northboro	764,181	1,831,054	-	-	-	2,595,235	2,400,138	8.13%	2,548,279
480	Northboro Housing Authority	24,610	56,596	-	-	-	81,206	75,236	7.94%	79,737
490	Northboro-Southboro Regional	209,528	318,988	-	-	-	528,516	442,802	19.36%	518,953
500	North Brookfield	229,552	428,509	-	15,692	-	673,753	578,613	16.44%	661,563
510	North Brookfield Housing Authority	6,257	16,042	-	-	-	22,299	18,708	19.19%	21,896
530	Oakham	20,746	57,763	-	-	-	78,509	80,050	-1.93%	77,089
540	Oxford	741,763	1,614,338	148,991	16,854	-	2,521,946	2,229,090	13.14%	2,476,316

SECTION 9 - MEMBER UNIT FY2022 APPROPRIATION

Unit	Unit Name	Normal Cost	UAL	2002 ERI	2003 ERI	2010 ERI	FYE2022	FYE2021	Increase over	Payment on
							Appropriation	Appropriation	FYE 2021	7/1/2021
550	Oxford Housing Authority	25,871	60,119	-	-	-	85,990	83,797	2.62%	84,434
555	Oxford-Rochdale Sewer District	11,706	31,227	-	-	-	42,933	38,534	11.42%	42,156
560	Paxton	363,975	567,071	-	-	-	931,046	853,241	9.12%	914,200
570	Petersham	54,726	131,666	-	2,518	-	188,910	174,811	8.07%	185,492
580	Phillipston	61,429	91,561	-	-	-	152,990	152,104	0.58%	150,222
590	Princeton	110,463	361,057	9,157	-	-	480,677	416,445	15.42%	471,980
600	Quabbin Regional	300,994	862,521	57,994	8,522	-	1,230,031	1,147,408	7.20%	1,207,776
610	Quaboag Regional	125,784	276,496	33,574	-	-	435,854	408,583	6.67%	427,968
620	Royalston	17,801	49,294	-	-	-	67,095	63,203	6.16%	65,881
630	Rutland	285,994	497,409	6,870	-	-	790,273	696,817	13.41%	775,974
640	Southboro	735,491	1,628,823	-	-	-	2,364,314	2,211,126	6.93%	2,321,536
650	Southboro Housing	7,221	11,584	12,018	-	-	30,823	16,500	86.81%	30,265
660	Spencer	362,334	750,650	-	-	-	1,112,984	996,414	11.70%	1,092,846
670	Spencer-East Brookfield Regional	249,249	448,392	25,944	4,454	-	728,039	667,641	9.05%	714,866
680	Spencer Housing Authority	11,883	49,181	-	-	-	61,064	51,695	18.12%	59,959
690	Sterling	434,421	829,830	-	15,304	-	1,279,555	1,219,207	4.95%	1,256,404
700	Sterling Housing Authority	4,744	6,704	-	-	-	11,448	6,246	83.29%	11,241
710	Sturbridge	661,725	974,216	-	69,744	-	1,705,685	1,529,714	11.50%	1,674,824
720	Sutton	447,063	998,427	-	-	-	1,445,490	1,339,096	7.95%	1,419,336
730	Tantasqua Regional	279,614	554,692	-	-	-	834,306	794,242	5.04%	819,211
740	Templeton	266,148	692,721	23,465	-	-	982,334	903,775	8.69%	964,560
750	Templeton Housing Authority	8,355	23,143	23,272	-	-	54,770	46,383	18.08%	53,779
760	Upton	216,243	558,822	-	-	-	775,065	709,704	9.21%	761,042
770	Uxbridge	623,753	1,530,282	80,886	-	-	2,234,921	2,089,302	6.97%	2,194,484
780	Uxbridge Housing Authority	15,893	53,601	-	-	-	69,494	59,854	16.11%	68,237
790	Wachusett Regional	871,982	1,459,494	62,000	-	-	2,393,476	2,120,256	12.89%	2,350,170
800	Warren	135,472	272,436	57,612	-	5,764	471,284	410,167	14.90%	462,757
810	Warren Water District	8,717	13,871	-	-	-	22,588	19,873	13.66%	22,179
820	Westboro	1,442,036	3,668,130	-	38,746	-	5,148,912	4,584,030	12.32%	5,055,753
825	Westboro Housing Authority	19,838	31,067	5,530	-	-	56,435	51,300	10.01%	55,414
830	West Boylston	534,999	941,723	65,627	-	-	1,542,349	1,459,078	5.71%	1,514,443

SECTION 9 - MEMBER UNIT FY2022 APPROPRIATION

Unit	Unit Name	Normal Cost	UAL	2002 ERI	2003 ERI	2010 ERI	FYE2022 Appropriation	FYE2021 Appropriation	Increase over FYE 2021	Payment on 7/1/2021
835	West Boylston Housing Authority	7,031	11,391	-	-	-	18,422	6,244	195.04%	18,089
840	West Boylston Water District	14,075	63,846	-	-	-	77,921	74,861	4.09%	76,511
850	West Brookfield	133,090	209,437	-	-	-	342,527	322,339	6.26%	336,330
860	Westminster	271,246	781,803	-	5,424	-	1,058,473	981,818	7.81%	1,039,322
870	Winchendon	562,702	1,271,431	65,816	-	-	1,899,949	1,738,528	9.28%	1,865,573
880	Winchendon Housing Authority	43,120	94,687	5,150	-	-	142,957	128,412	11.33%	140,370
Total		23,466,626	49,846,133	1,618,497	317,326	5,764	75,254,346	68,444,153	9.95%	73,892,749