January 1, 2023

# Actuarial Valuation Report

## MHFA Employees' Retirement System

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May 10, 2023

Massachusetts Housing Finance Agency Employees' Retirement System
One Beacon Street
Boston, MA 02108

To the Massachusetts Housing Finance Agency Retirement Board:

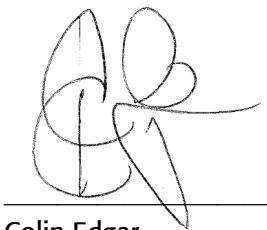
Stone Consulting, Inc. has performed a January 1, 2023 actuarial valuation of the Massachusetts Housing Finance Agency Retirement System. This valuation and report were prepared using generally accepted actuarial principles and practices. To the best of our knowledge, this report is complete and accurate, and the assumptions used represent a reasonable estimate of anticipated experience of the system except where noted in the text.

Stone Consulting, Inc. is completely independent of the Massachusetts Housing Finance Agency and the Massachusetts Housing Finance Agency Retirement System. This includes any of its officers and key personnel. Neither we nor anyone else closely associated with us has any relationship with the Massachusetts Housing Finance Agency of Massachusetts Housing Finance Agency or the Massachusetts Housing Finance Agency Retirement System that would impair our independence, other than this or related assignments.

We are pleased to present the results of this valuation. If the Retirement Board has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in inaccurate or misleading understanding of the results. The use of these results may not be appropriate for all circumstances.

We, Colin Edgar and Joan Moreau, are consultants for Stone Consulting, Inc. We are members of the American Academy of Actuaries, and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.
Actuaries for the Plan



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## Report Summary

This report presents the results of the actuarial valuation of the Massachusetts Housing Finance Agency Retirement System as of January 1, 2023. The valuation was performed at the request of the Retirement Board for the purpose of determining the contribution requirements for Fiscal Year 2024 and beyond.

### Summary of Results and Experience

- Funding progress

  Due to asset losses in cy2022, the System is no longer fully funded as of 1/1/2023. The funding schedule shown on page 3 is projected to amortize the unfunded liability in five years, with the first contribution (FY2024) being $4,727,032.

- Assumptions/methodology:

  Changes in assumptions and methodology compared to the previous valuation fall into two major categories:

  1. COLA Changes

     The prior valuation assumed ongoing 3% COLA increases on a $15,000 Base. The System has since increased the COLA Base by increments of $1,000, finishing in 2024 with a COLA of $18,000. In addition, a COLA of 5% was granted for FY2023. The net effect of these changes increased the liability as of 1/1/2023 by $2.6 million, and increased the net normal cost by $43 thousand.

  2. Assumption changes

     Rates of withdrawal, retirement, and mortality were updated based on the results of an experience study conducted by Stone Consulting in 2022. The net effect of these changes decreased the liability by $5.7 million, and decreased the net normal cost by $123 thousand.

  Assumptions and valuation methodology are discussed in Appendix A, on page 18.

Contribution requirements are based on the financial condition of the system as of December 31, 2022, as well as actuarial liability results, which are based on:

- The benefit provisions of M.G.L. Chapter 32 and related statutes;
- The demographics of members in the system (i.e., active and inactive participants, retirees and beneficiaries as of January 1, 2023);
- Economic assumptions regarding salary increases and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

## Format of the Report

- The funding schedule is shown on page 3, followed by an explanation of the actuarial results, funding schedule components, and a history of the funding schedules used by the Retirement System.
- Full actuarial valuation results are shown on page 17, with prior results included for comparison. The Massachusetts Housing Finance Agency Retirement Board conducted their previous actuarial valuation effective January 1, 2021.

## Development of Funding Schedule

The funding contribution consists of three parts:

- Net Normal Cost: this is the amount of liability generated by active employees earning another year of service, and includes administrative expense.
- Amortization: this is the amount of the Unfunded Liability that will be paid off by this contribution.
- Net 3(8)(c) Payments: these are benefit payments made between Retirement systems when a retiree of one system has service with another system. The net amount refers to the total annual payments made by the Massachusetts Housing Finance Agency Retirement System to other systems, minus the payments received. The amount is negative when the System receives more than it pays.

The appropriation for Fiscal 2024 is as follows:

| | | |
|---|---|---|
| Net Employer Normal Cost for Fiscal 2024 (including admin. expenses) | $ | 1,420,840 |
| Net 3(8)(c) Payments | | (529,516) |
| Amortization | | 3,835,707 |
| Timing Adjustment* | | 0 |
| Total Appropriation required for Fiscal 2024 | $ | 4,727,032 |

* Contributions are assumed to be made at the beginning of the fiscal year.

NOTE: for all tables in this report, totals may not sum due to rounding.

- The maximum funding schedule length allowed by Section 22D of Chapter 32 of the Massachusetts General Laws is seven years to Fiscal 2030.

## FUNDING SCHEDULE

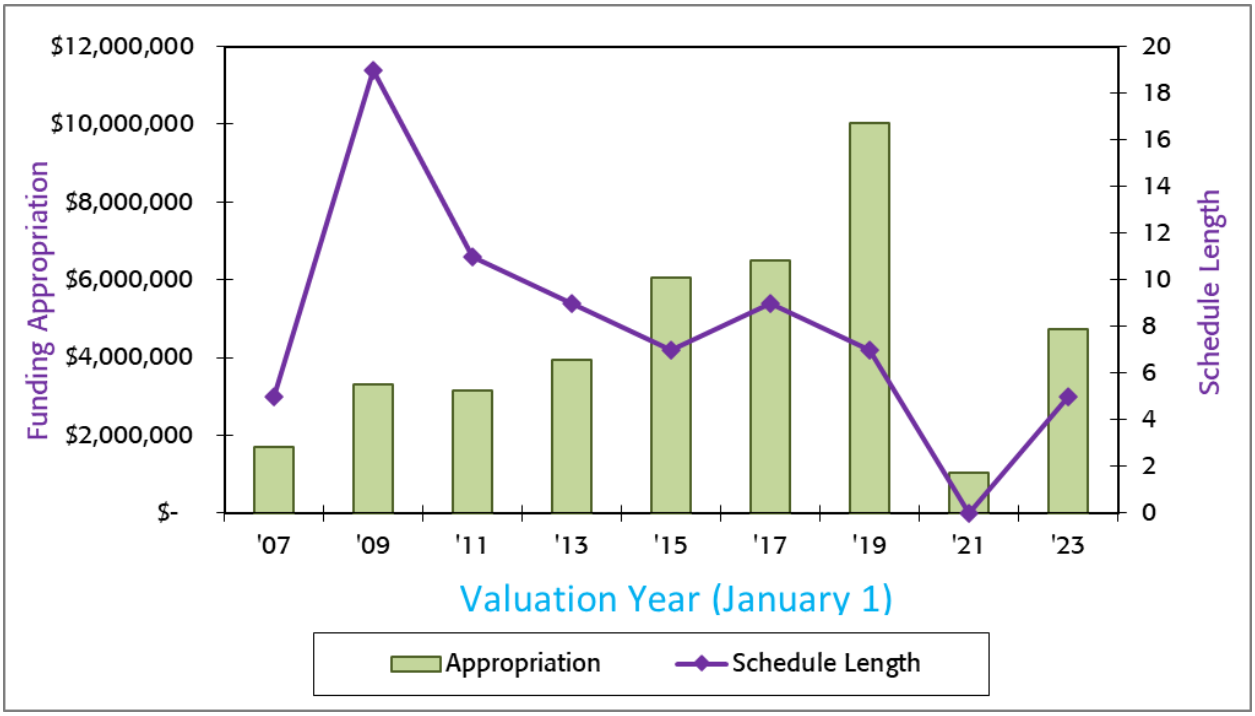
| Fiscal Year | Normal Cost | Unfunded Liability | Funding Amortization of UAAL | Net 3(8)(c) Payments | Schedule Contribution |
|---|---|---|---|---|---|
| 2024 | 1,420,840 | 16,828,059 | 3,835,707 | (529,516) | 4,727,032 |
| 2025 | 1,477,674 | 13,901,816 | 3,835,707 | (529,516) | 4,783,866 |
| 2026 | 1,536,781 | 10,770,736 | 3,835,707 | (529,516) | 4,842,973 |
| 2027 | 1,598,252 | 7,420,481 | 3,835,707 | (529,516) | 4,904,444 |
| 2028 | 1,662,182 | 3,835,707 | 3,835,707 | (529,516) | 4,968,374 |
| 2029 | 1,728,670 | - | - | (529,516) | 1,199,154 |

**Amortization of Unfunded Liability as of June 30, 2023**

| Year | Type | Original Amort. Amount | Percentage Increasing | Original # of Years | Current Amort. Amount | Years Remaining |
|---|---|---|---|---|---|---|
| 2024 | Fresh Start | 3,835,707 | 0.00% | 5 | 3,835,707 | 5 |

## History of Funding Effort

Below is a history of the length of funding schedule used by the Massachusetts Housing Finance Agency Retirement System, and the amount of the initial contribution for each funding schedule.

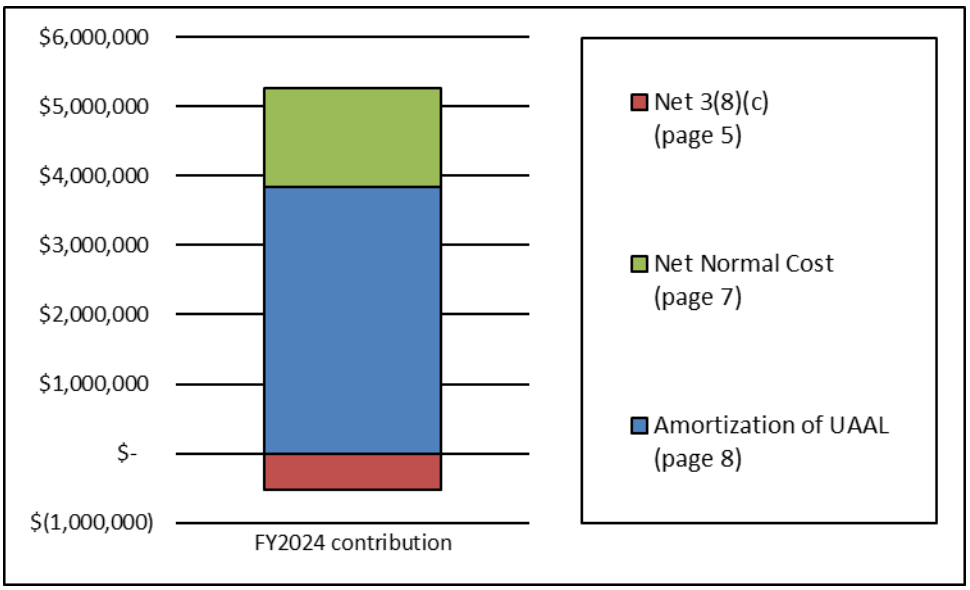



The funding objective of the plan is to fully fund the system while attempting to maintain a stable contribution amount for the upcoming fiscal year that is consistent with prior funding schedules or if employer finances allow it, to increase the contribution amount. This funding objective is being met.

The following pages discuss the components that make up the contribution, and how they are calculated from the actuarial results.

## Components of Funding Appropriation

Components of the funding contribution are compared below, and discussed on the following pages.




## Net 3(8)(c) Payments

- 3(8)(c) payments are benefits which the Massachusetts Housing Finance Agency Retirement System pays to or receives from other retirement boards for service that a retiree had with a different retirement system.

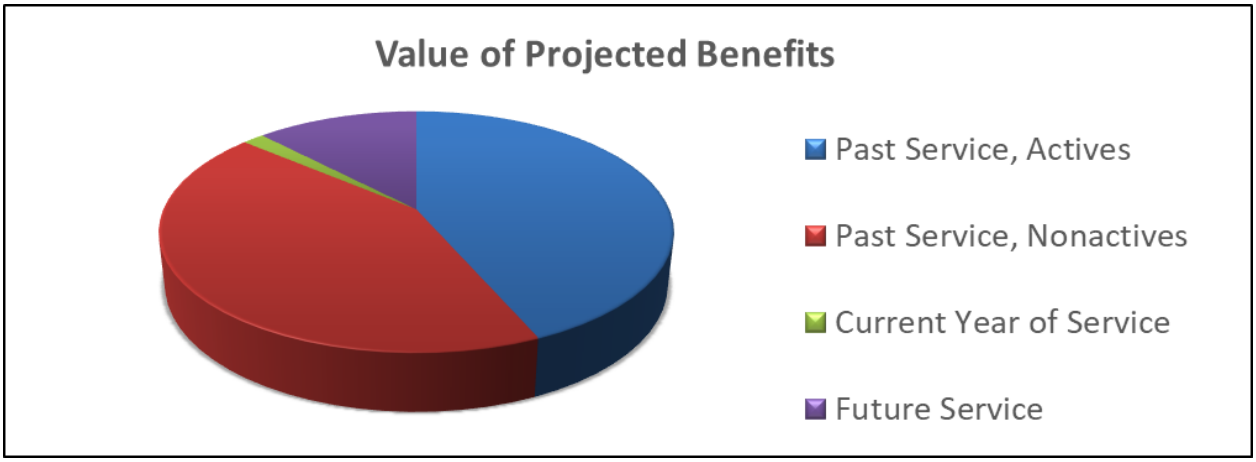
- The net amount is equal to what Massachusetts Housing Finance Agency pays out, less what Massachusetts Housing Finance Agency receives from other systems, based on the most recent PERAC annual statement:

| | | |
|---|---|---|
| 3(8)(c) payments made to other systems | $ | 139,985 |
| 3(8)(c) payments received from other systems | | (669,500) |
| Net payments | $ | (529,516) |

- For the funding schedule, the amount of net payments is assumed to remain level in future years.

## Development of Actuarial Results

Actuarial liabilities are calculated based on benefits that members are projected to receive in the future. The value of projected benefits is divided between past service, future service, and the current year of service.




The actuarial funding method (in this case, entry age normal), assigns values to each of these periods of service.

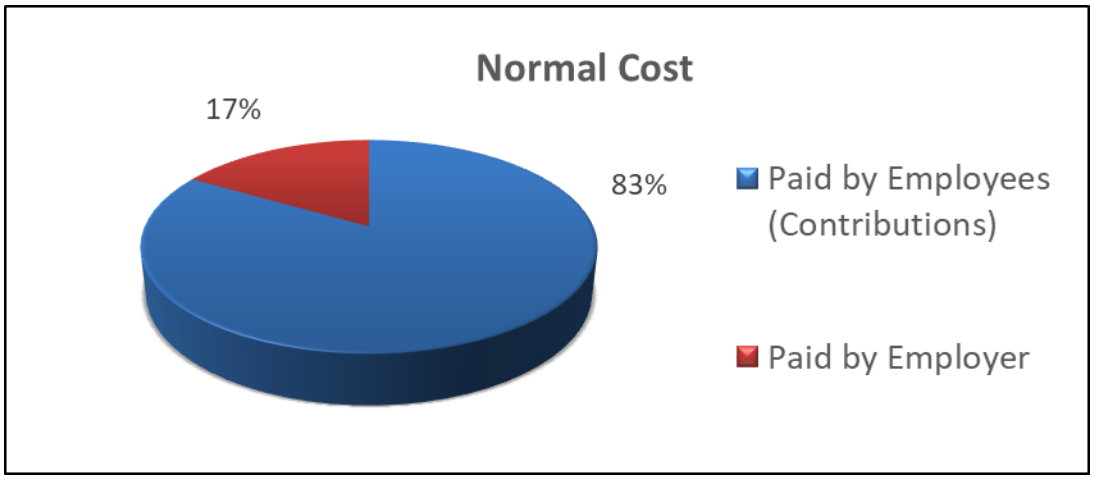
- Past service: The Actuarial Accrued Liability (AAL), is the portion of the benefit value that is associated with past service; this can be thought of as the "price" of benefits already earned by members of the system. For retirees, the "past service" amount accounts for the entire value of their benefits; they have completed their careers, and will earn no more service during the current year or any future years.

- Current year: The "price" of benefits being earned during the current year is referred to as the Normal Cost (NC). This includes only the actives, as neither inactives nor retirees are earning any additional service.

- Future service: The amount for future service is not included in the liability, as those years of service have not yet been earned. This only applies to actives.

## Net Normal Cost

The entire Normal Cost is not borne by the System; a significant portion is paid by employee contributions. The portion of the Normal Cost not covered by employee contributions is the amount that must be paid through funding appropriations; this is the Net Normal Cost.




The Net Normal Cost as seen in the funding schedule is calculated by adjusting for timing, and adding in the administrative expense. The calculation is shown below, and compared to the covered payroll:

| | January 1, 2023 | % of Payroll* |
|---|---|---|
| Gross Normal Cost (GNC) | $ 4,350,672 | 11.8% |
| Employees Contribution | 3,627,083 | 9.8% |
| Net Normal Cost (NNC) | $ 723,589 | 2.0% |
| Adjustment to beginning of Fiscal Year 2024** | 14,330 | |
| Administrative Expense | 682,922 | 1.9% |
| Adjusted Net Normal Cost With Admin. Expense | $ 1,420,840 | |

* Payroll paid in 2022 for employees as of January 1, 2023 is $36,887,015. Payroll for new hires in 2022 was annualized.

** The NNC is adjusted from January 1, 2023 to Fiscal 2024 by rolling it forward with a salary increase factor of 4.00%.

## Unfunded Liability

The Unfunded Actuarial Accrued Liability (UAAL) is the portion of the AAL that is not covered by the value of the plan assets.

This is adjusted from the date of the valuation to the date of the contribution (July 1, 2023) to produce the Unfunded Liability seen in Fiscal Year 2024 in the funding schedule.

The liability results were as follows:

| | January 1, 2023 |
|---|---|
| Actuarial Accrued Liability | |
| a. Active Members | $ 116,493,478 |
| b. Inactive Members | 4,495,258 |
| c. Retired Members and Beneficiaries | 114,676,581 |
| d. Total | $ 235,665,317 |
| Unfunded Actuarial Accrued Liability | |
| a. Actuarial Accrued Liability | $ 235,665,317 |
| b. Less Actuarial Value of Assets | 219,758,813 |
| c. Unfunded Actuarial Accrued Liability (UAAL) | $ 15,906,504 |
| d. Adjustment to June 30, 2023 | 921,555 |
| e. UAAL as of June 30, 2023 | $ 16,828,059 |

The UAAL and funding ratio are measures of the plan's funded status, which reflect the plan's position as of January 1, 2023. We believe these measures, by themselves, are not appropriate for assessing the sufficiency of plan assets to cover the estimated cost of settling the plan's benefit obligations. However, we believe these measures, in conjunction with the plan's funding schedule, are appropriate for assessing the amount of future contributions.

## Active Liability by Decrement

An active member can incur liabilities for the Retirement System in one of four ways:

- They can retire (if eligible),
- They can become disabled and collect a disability benefit,
- They can die, or
- They can terminate service and withdraw their ASF balance or receive a deferred retirement benefit

Active members have a portion of their liability associated with each of these four possible outcomes. The Accrued Liability for active members is divided as follows:

| Active Actuarial Accrued Liability | |
|---|---|
| Superannuation Retirement | $ 113,231,586 |
| Death | 1,714,922 |
| Disability | 923,057 |
| Withdrawal | 623,913 |
| TOTAL | $ 116,493,478 |

## Demographic Results

| | |
|---|---|
| Actives | |
| a. Number | 316 |
| b. Annual Compensation | $36,887,015 |
| c. Average Annual Compensation | $116,731 |
| d. Average Attained Age | 50.3 |
| e. Average Past Service | 14.6 |
| Retired, Disabled and Beneficiaries | |
| a. Number | 210 |
| b. Total Benefits (excluding State COLA) | $10,990,532 |
| c. Average Benefits | $52,336 |
| d. Average Age | 72.5 |
| Inactives | |
| a. Number | 63 |

- Total compensation changed by 8.6% over the prior valuation
  - Average annual compensation changed by 7.2%
  - Salary loss of $400,000 compared to projected experience

## History of Demographic Statistics

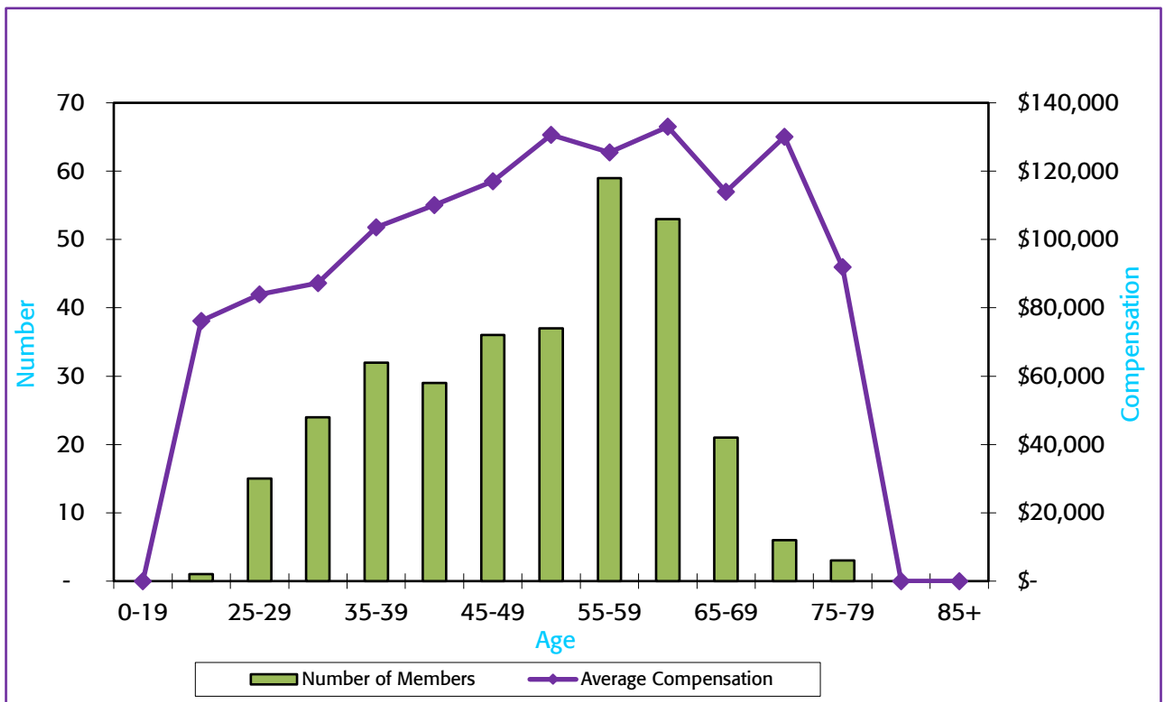
| Valuation Year | Actives | Average Age | Average Past Service | Average Ann'l Pay |
|---|---|---|---|---|
| 2023 | 316 | 50.3 | 14.6 | $116,731 |
| 2021 | 312 | 50.4 | 15.2 | $108,909 |
| 2019 | 323 | 51.0 | 15.5 | $102,223 |
| 2017 | 340 | 50.3 | 14.3 | $94,181 |
| 2015 | 337 | 50.5 | 14.9 | $92,701 |
| 2013 | 328 | 50.0 | 15.0 | $85,501 |
| 2011 | 354 | 48.3 | 13.7 | $84,023 |
| 2009 | 349 | 46.7 | 10.5 | $81,592 |
| 2007 | 334 | 45.8 | 9.9 | $76,532 |
| 2005 | 315 | 43.8 | 8.5 | $71,966 |
| 2002 | 312 | 43.6 | 7.9 | $65,134 |

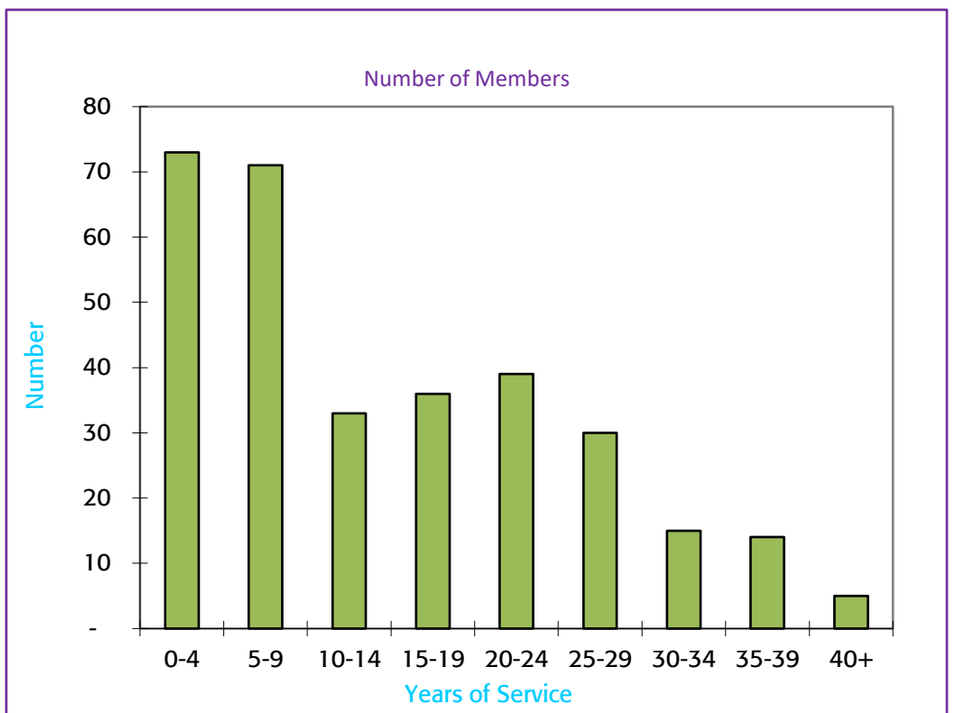
- Both employee age and service have decreased over the past four years following steady increases in previous years. This has started to change for many other Chapter 32 systems; however, the MHFA demographics and structure are significantly different from the typical city or town in Massachusetts. Average annual compensation has grown by 79.2% (2.8% annually) over the past twenty-one years.

## Distribution of Plan Members as of January 1, 2023

ACTIVE MEMBERS

| AGE | 0-4 Years | 5-9 Years | 10-14 Years | 15-19 Years | 20-24 Years | 25-29 Years | 30-34 Years | 35-39 Years | 40 + Years | Total | Total Compensation | Average Compensation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0-19 | - | - | - | - | - | - | - | - | - | - | $ - | $ - |
| 20-24 | 1 | - | - | - | - | - | - | - | - | 1 | $ 76,119 | $ 76,119 |
| 25-29 | 14 | 1 | - | - | - | - | - | - | - | 15 | $ 1,259,142 | $ 83,943 |
| 30-34 | 12 | 11 | 1 | - | - | - | - | - | - | 24 | $ 2,093,590 | $ 87,233 |
| 35-39 | 15 | 14 | 3 | - | - | - | - | - | - | 32 | $ 3,315,392 | $ 103,606 |
| 40-44 | 7 | 10 | 4 | 6 | 2 | - | - | - | - | 29 | $ 3,193,009 | $ 110,104 |
| 45-49 | 8 | 9 | 7 | 4 | 4 | 3 | 1 | - | - | 36 | $ 4,212,761 | $ 117,021 |
| 50-54 | 5 | 8 | 5 | 5 | 8 | 6 | - | - | - | 37 | $ 4,833,690 | $ 130,640 |
| 55-59 | 5 | 5 | 4 | 11 | 13 | 6 | 9 | 5 | 1 | 59 | $ 7,405,695 | $ 125,520 |
| 60-64 | 5 | 10 | 7 | 6 | 8 | 7 | 4 | 5 | 1 | 53 | $ 7,048,007 | $ 132,981 |
| 65-69 | 1 | 3 | 2 | 3 | 3 | 4 | - | 4 | 1 | 21 | $ 2,393,392 | $ 113,971 |
| 70-74 | - | - | - | 1 | - | 3 | 1 | - | 1 | 6 | $ 780,664 | $ 130,111 |
| 75-79 | - | - | - | - | 1 | 1 | - | - | 1 | 3 | $ 275,554 | $ 91,851 |
| 80-84 | - | - | - | - | - | - | - | - | - | - | $ - | $ - |
| 85+ | - | - | - | - | - | - | - | - | - | - | $ - | $ - |
| **TOTAL** | **73** | **71** | **33** | **36** | **39** | **30** | **15** | **14** | **5** | **316** | **$ 36,887,015** | **$ 116,731** |



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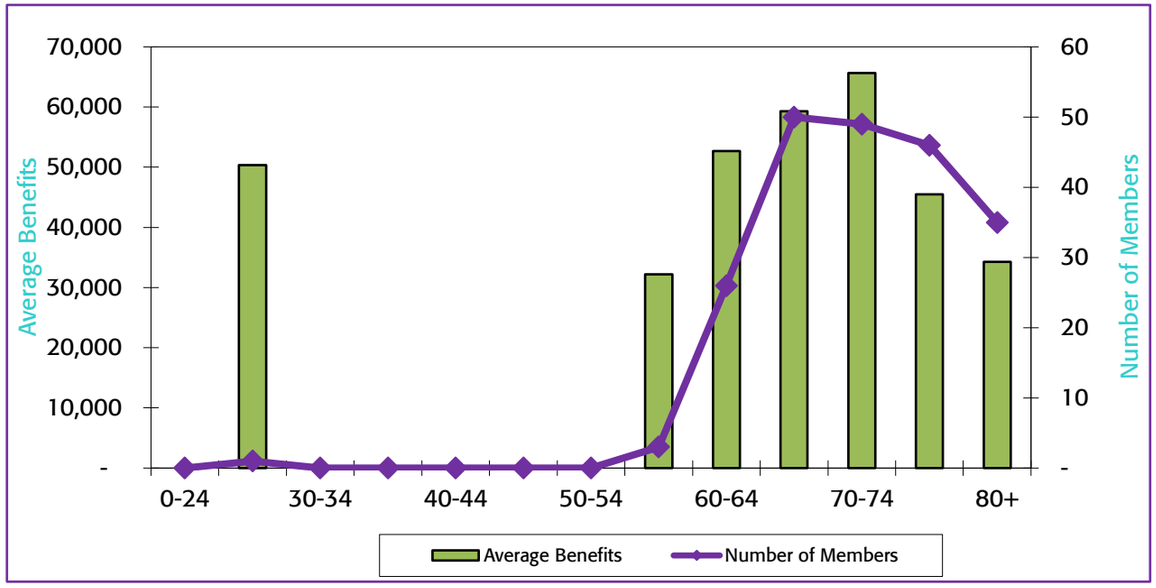
# Distribution of Plan Members as of January 1, 2023

## RETIRED MEMBERS

| Retired Members and Beneficiaries | | | |
|---|---|---|---|
| Age | Number | Average Benefit | Total Benefit |
| 0-24 | - | - | - |
| 25-29 | 1 | 50,323 | 50,323 |
| 30-34 | - | - | - |
| 35-39 | - | - | - |
| 40-44 | - | - | - |
| 45-49 | - | - | - |
| 50-54 | - | - | - |
| 55-59 | 3 | 32,179 | 96,537 |
| 60-64 | 25 | 53,271 | 1,331,786 |
| 65-69 | 50 | 59,271 | 2,963,572 |
| 70-74 | 49 | 65,638 | 3,216,259 |
| 75-79 | 46 | 45,507 | 2,093,305 |
| 80+ | 34 | 34,215 | 1,163,317 |
| **TOTAL** | **208** | **$ 52,476** | **$ 10,915,099** |

| Disabled Members | | | |
|---|---|---|---|
| Age | Number | Average Benefit | Total Benefit |
| 0-24 | - | - | - |
| 25-29 | - | - | - |
| 30-34 | - | - | - |
| 35-39 | - | - | - |
| 40-44 | - | - | - |
| 45-49 | - | - | - |
| 50-54 | - | - | - |
| 55-59 | - | - | - |
| 60-64 | 1 | 38,368 | 38,368 |
| 65-69 | - | - | - |
| 70-74 | - | - | - |
| 75-79 | - | - | - |
| 80+ | 1 | 37,066 | 37,066 |
| **TOTAL** | **2** | **$ 37,717** | **$ 75,434** |

| Total | | | |
|---|---|---|---|
| Age | Number | Average Benefit | Total Benefit |
| 0-24 | - | - | - |
| 25-29 | 1 | 50,323 | 50,323 |
| 30-34 | - | - | - |
| 35-39 | - | - | - |
| 40-44 | - | - | - |
| 45-49 | - | - | - |
| 50-54 | - | - | - |
| 55-59 | 3 | 32,179 | 96,537 |
| 60-64 | 26 | 52,698 | 1,370,154 |
| 65-69 | 50 | 59,271 | 2,963,572 |
| 70-74 | 49 | 65,638 | 3,216,259 |
| 75-79 | 46 | 45,507 | 2,093,305 |
| 80+ | 35 | 34,297 | 1,200,383 |
| **TOTAL** | **210** | **$ 52,336** | **$ 10,990,532** |



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## Assets

| | | | |
|---|---|---|---|
| | Cash | $ | 889,781.66 |
| | Fixed Income Securities | | 18,088,544.07 |
| | Pooled Domestic Equity Funds | | 51,465,057.23 |
| | Pooled International Equity Funds | | 37,638,699.54 |
| | Pooled Domestic Fixed Income Funds | | 20,445,039.20 |
| | Pooled International Fixed Income Funds | | 8,943,775.57 |
| | Pooled Alternative Investments | | 55,253,194.35 |
| | Pooled Real Estate Funds | | 27,126,498.05 |
| A | Sub-Total: | $ | 219,850,589.67 |
| | Interest Due and Accrued | $ | 130,185.42 |
| | Accounts Receivable | | 83,483.90 |
| | Accounts Payable | | -274,335.52 |
| B | Sub-Total: | $ | -60,666.20 |
| | Market Value of Assets [(A) + (B)]* | $ | 219,789,923.47 |

- The asset allocation is approximately 22% fixed income, cash, receivables and payables and 78% equities, alternative investments, hedge funds and similar types of investments.

- Annual average return in calendar 2021 and 2022: 3.01% vs. a 7.00% assumption.
  - $19,169,788 net actuarial loss in calendar years 2021 and 2022

### Adjustment for 5% COLA

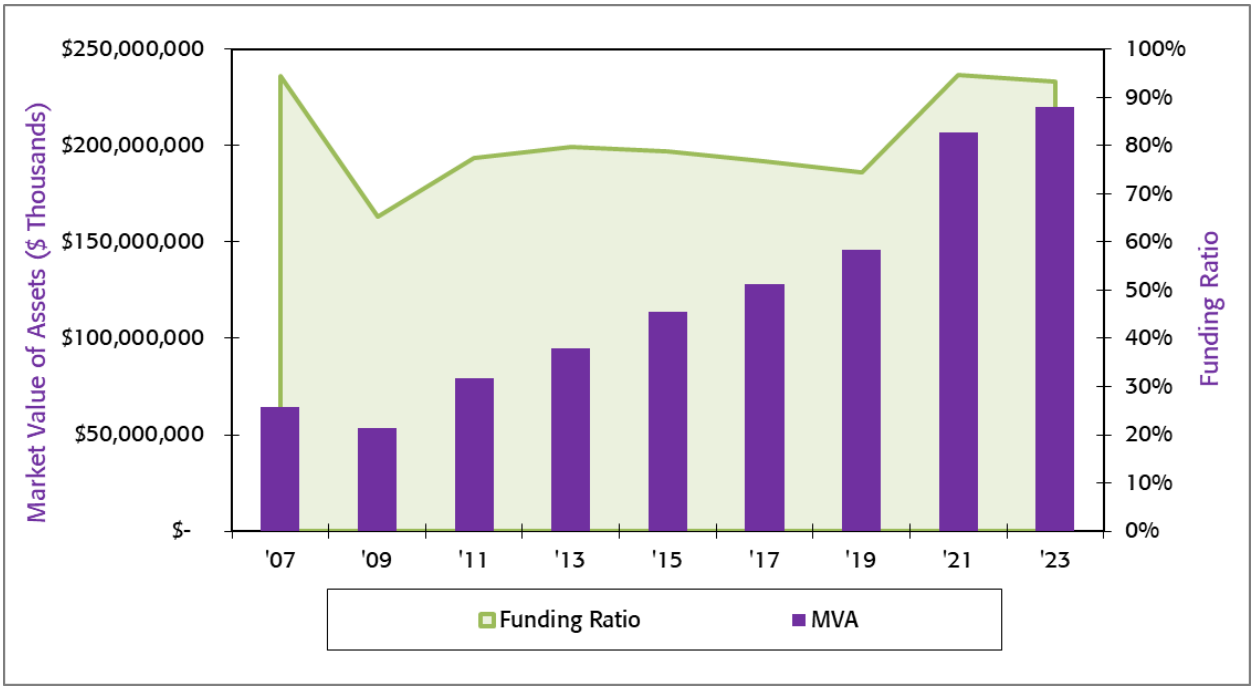
* The value used for Market Value of Assets in this valuation was reduced by $31,110.60 compared to the total shown above from the asset data provided, in order to reflect the projected impact of granting a 5% COLA for FY2023. This benefit increase is retroactive to June 30, 2022, so one half-year of the benefit increase would be considered payable as of the beginning of the year.

### Actuarial Value of Assets

For its Actuarial Value of Assets (AVA), Massachusetts Housing Finance Agency uses the Market Value of Assets, adjusted for payables and receivables.

## Funding Ratio

The following displays the history of the funding ratio for the past eight valuations, based on Market Value of Assets. The Market Value for each year is shown to accompany the funding ratio. We show the market value of assets as that is the amount of assets actually available to pay for benefits.




## Risk

Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as:

- Plan experience differing from that anticipated by the economic or demographic assumptions,
- Changes in economic or demographic assumptions,
- Increases or decreases expected as part of natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status,
- Changes in plan provisions or applicable law.

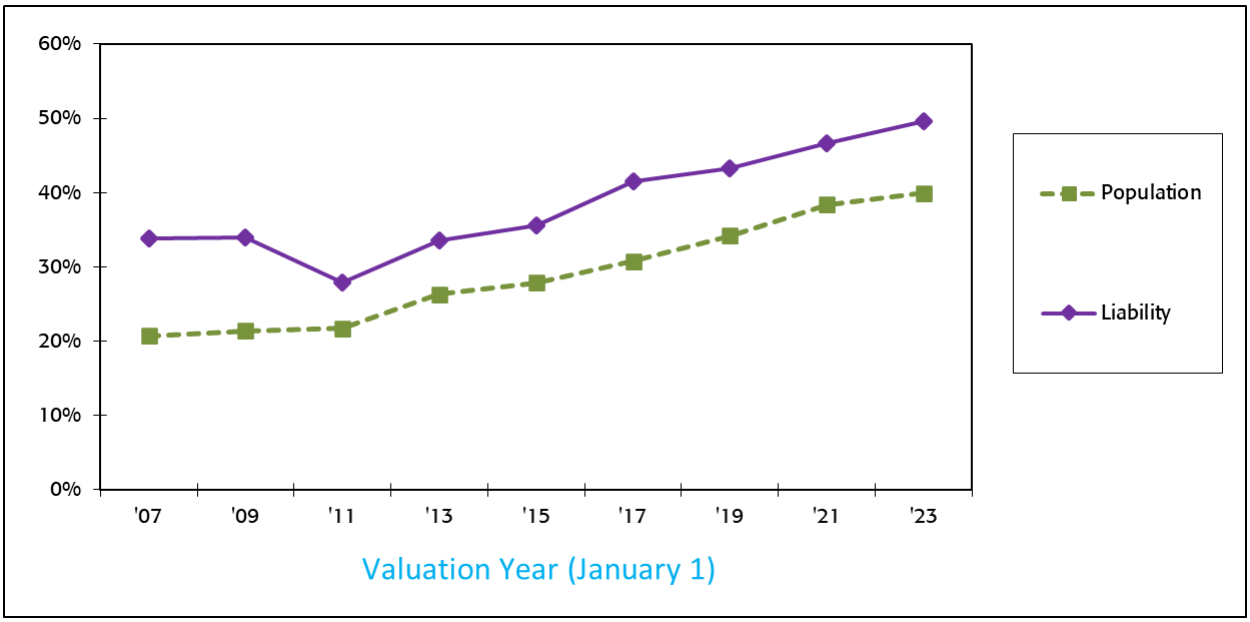
As is evident from the exhibit displaying historical contribution patterns on page 4, another significant risk issue for the System is the volatility of required contributions that can occur when a system is at or near full funding. For systems with lower unfunded liabilities and shorter funding schedules, the potential for volatile returns to translate to volatile contributions is increased. For example: a $10 million actuarial asset loss would represent a 10% increase in unfunded liability for a system with $100 million unfunded liability prior to the asset loss; however, for a system with only $5 million in unfunded liability such a loss would result in the UAAL increasing by 200%.

While no longer being fully funded does not by itself pose a risk to the System, it is important that the Agency is fully cognizant of the potential volatility of the contribution level. As part of the valuation, we have not performed an analysis of the potential range of future measurements. GASB Statement 67 and 68 reports for the Massachusetts Housing Finance Agency Retirement System contain alternate results to measure the impact of increases or decreases in the discount rate.

## Maturity

One important concern is the maturity of the system. Systems with a greater portion of their liability stemming from current retirees whose benefits already being paid are likely to experience greater impact from short-term asset experience, as high payouts in the near future leave less of the current assets available to benefit from investment returns further in the future.

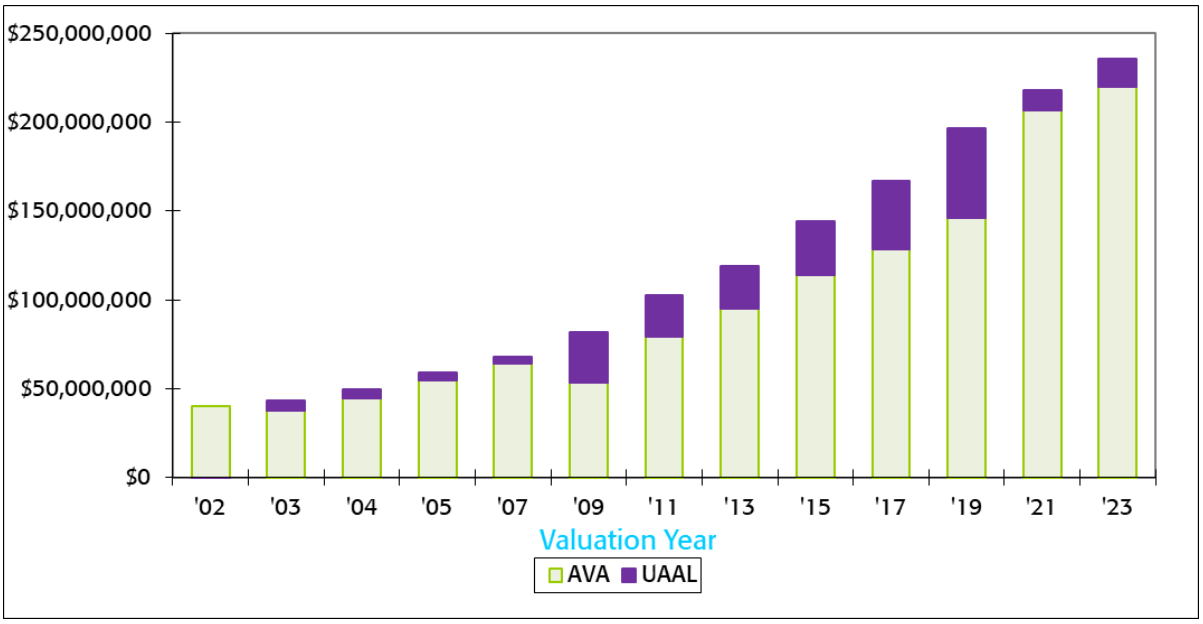
Below is a history of the retiree's percentage of the covered population and liability. The retiree percentage of both liability and population have steadily increased over past valuations, but remain lower than many Chapter 32 retirement systems.



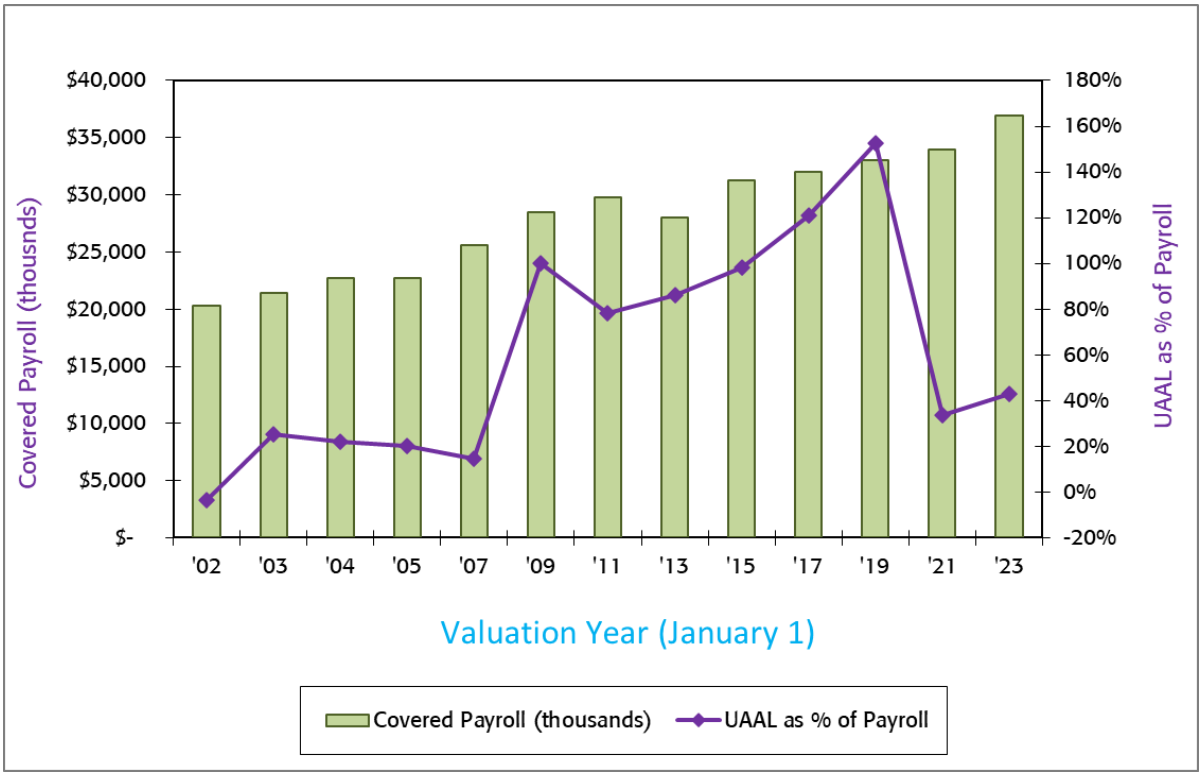
## Historical Experience

The following charts display Massachusetts Housing Finance Agency's history of Actuarial Assets and Unfunded Liability; the second chart compares the unfunded liability to covered payroll.

### History of Assets and Unfunded Liability




### History of Unfunded Liability and Covered Payroll



## Comparative Results

| | January 1, 2023 | January 1, 2021 | Percentage Change |
|---|---|---|---|
| **Funding** | | | |
| Contribution for Fiscal 2024 | $4,727,032 | $1,146,381 | 312.3% |
| **Members** | | | |
| ▪ Actives | | | |
| a. Number | 316 | 312 | 1.3% |
| b. Annual Compensation | $36,887,015 | $33,979,549 | 8.6% |
| c. Average Annual Compensation | $116,731 | $108,909 | 7.2% |
| d. Average Attained Age | 50.3 | 50.4 | -0.2% |
| e. Average Past Service | 14.6 | 15.2 | -4.1% |
| ▪ Retired, Disabled and Beneficiaries | | | |
| a. Number | 210 | 194 | 8.2% |
| b. Total Benefits | $10,990,532 | $9,419,542 | 16.7% |
| c. Average Benefits | $52,336 | $48,554 | 7.8% |
| d. Average Age | 72.5 | 71.8 | 1.0% |
| ▪ Inactives | | | |
| a. Number | 63 | 61 | 3.3% |
| **Normal Cost** | | | |
| a. Total Normal Cost as of January 1 | $4,350,672 | $3,945,298 | 10.3% |
| b. Less Expected Members' Contributions | 3,627,083 | 3,186,556 | 13.8% |
| c. Net Normal Cost | $723,589 | $758,742 | -4.6% |
| d. Adjustment to July 1 | 14,330 | 15,026 | -4.6% |
| e. Administrative Expense Assumption | 682,922 | 649,144 | 5.2% |
| f. Net Normal Cost Adjusted to July 1 | $1,420,840 | $1,422,912 | -0.1% |
| **Actuarial Accrued Liability** | | | |
| a. Active Members | $116,493,478 | $114,321,778 | 1.9% |
| b. Inactive Members | 4,495,258 | 4,211,151 | 6.7% |
| c. Retired Members and Beneficiaries | 114,676,581 | 99,700,140 | 15.0% |
| d. Total | $235,665,317 | $218,233,069 | 8.0% |
| **Unfunded Actuarial Accrued Liability** | | | |
| a. Actuarial Accrued Liability | $235,665,317 | $218,233,069 | 8.0% |
| b. Less Actuarial Value of Assets | 219,758,813 | 206,777,256 | 6.3% |
| c. Unfunded Actuarial Accrued Liability | $15,906,504 | $11,455,814 | 38.9% |
| d. Adjustment to July 1 | 921,555 | 786,596 | |
| e. Unfunded Actuarial Accrued Liability as of July 1 | $16,828,059 | $12,242,410 | |

# APPENDICES

## Appendix A – Actuarial Methods and Assumptions

All assumptions and methodologies were either set by statute or selected by the Massachusetts Housing Finance Agency Retirement Board in conjunction with guidance provided by Stone Consulting, Inc.

Stone Consulting, Inc. was furnished member and financial data by the Massachusetts Housing Finance Agency Retirement System's administrative staff. Although examined under broad parameters for reasonableness, the data was not audited by the actuary. With the assistance of the staff of the Massachusetts Housing Finance Agency Retirement Board, we were able to develop a database sufficient for valuation purposes.

### ASSUMPTION AND METHODOLOGY CHANGES SINCE PRIOR VALUATION

- COLA changes: The COLA Base was increased from $15,000 to $18,000 in annual increments of $1,000, with an additional 2% increase for FY23 (on a Base of $16,000). The net effect of these changes increased the liability by $2.6 million and increased the net normal cost by $43 thousand.

- Demographic assumptions: rates of mortality, withdrawal, and retirement were revised based on the results of an experience study conducted by Stone Consulting in 2022. The net effect of these changes decreased the liability by $5.7 million, and decreased the net normal cost by $123 thousand.

- All other assumptions are consistent with the prior valuation.

### ACTUARIAL METHODS

#### Actuarial Cost Method

The Entry Age Normal Actuarial Cost Method has been used in this valuation. Under this method, the normal cost is the amount calculated as the level percentage of compensation necessary to fully fund the prospective benefits from each member's entry age to retirement age.

The actuarial accrued liability represents the theoretical accumulation of all prior years' normal costs for the plan members as if the program had always been in effect. The unfunded actuarial accrued liability is the portion of the actuarial accrued liability over plan assets. The use of the Entry Age Normal actuarial funding method is consistent with the requirements of Chapter 32 of the Massachusetts General Laws.

## Actuarial Methods and Assumptions (Continued)

### Asset Valuation Method

Market Value of Assets, adjusted for payables and receivable.

### Fiscal Year Adjustment

The actuarial results are adjusted by the valuation interest rate and salary scale to the beginning of Fiscal Year 2024. The unfunded actuarial accrued liability is rolled forward with normal cost and further adjusted by anticipated contributions and interest.

## ACTUARIAL ASSUMPTIONS

### Valuation Date

January 1, 2023.

### Investment Return

7.00% per year net of investment expenses.

The investment return assumption is a long-term assumption and is based on capital market expectations by asset class, historical returns, and professional judgement.

### Salary Increases

Members are assumed to receive the following increases, based on years of service:

- Year 1: 5.25%
- Years 2 and 3: 5.00%
- Years 4 and 5: 4.75%
- Years 6 and 7: 4.50%
- Years 8 and 9: 4.25%
- All other years: 3.75%

The total payroll is assumed to increase at 4.00% per year. The salary increase assumption reflects prior experience including PERAC's 2002 local experience study, current expectations, and professional judgement.

## Actuarial Methods and Assumptions (Continued)

### Regular Interest Rate Credited to Annuity Savings Account

2% per year.

### Credited Service

All service is assumed to be due to employment with the municipality.

### Family Composition

Members assumed married with 2 dependent children – one male and one female both age 15; age difference between member and spouse assumed to be 3 years (the male being the older).

### Administrative Expenses

Estimated budgeted amount of $682,922 for Fiscal Year 2024 is added to the Normal Cost. The administrative expense does not include investment manager and custodial fees. These fees are considered part of the discount rate assumption that is net of fees.

### Net 3(8)(c)

Net 3(8)(c) payments are assumed to be the same level as the past calendar year for all future years.

### Contribution Timing

Contributions are assumed to be made at the beginning of the fiscal year.

### In-Service Disability and Death

Both Disability and In-Service Death are assumed to be 75% ordinary and 25% accidental.

### Cost-of-Living Increases

A 3% COLA on the first $17,000 of a member's retirement allowance is assumed to be granted in 2023, increasing to $18,000 in 2024. For cy2022, a 5% COLA was granted on a $16,000 Base.

## Actuarial Methods and Assumptions (Continued)

### Withdrawal Prior to Retirement

Withdrawal rates by age and service are shown below. Withdrawal rates are set to zero if the retirement rate at that age is nonzero.

| Svc\Age | 20-29 | 30-44 | 45-49 | 50-59 | 60+ |
|---|---|---|---|---|---|
| 0 | 7.5% | 3.75% | 3.75% | 3.75% | 3.75% |
| 1 | 12% | 8.4% | 8.4% | 8.4% | 6% |
| 2 | 10% | 7% | 7% | 7% | 5% |
| 3 | 9% | 6.3% | 6.3% | 6.3% | 4.5% |
| 4 | 8% | 5.6% | 5.6% | 5.6% | 4% |
| 5 | 7.6% | 7.6% | 7.6% | 5.32% | 3.8% |
| 6 | 7.5% | 7.5% | 7.5% | 5.25% | 3.75% |
| 7 | 6.7% | 6.7% | 6.7% | 4.69% | 3.35% |
| 8 | 6.3% | 6.3% | 6.3% | 4.41% | 3.15% |
| 9 | 5.9% | 5.9% | 5.9% | 4.13% | 2.95% |
| 10 | 8.1% | 8.1% | 5.4% | 5.4% | 0% |
| 11 | 7.5% | 7.5% | 5% | 5% | 0% |
| 12 | 6.9% | 6.9% | 4.6% | 4.6% | 0% |
| 13 | 6.15% | 6.15% | 4.1% | 4.1% | 0% |
| 14 | 5.55% | 5.55% | 3.7% | 3.7% | 0% |
| Ultimate | 3% | 3% | 2% | 2% | 0% |

The rates shown at the following sample ages illustrate the withdrawal assumption from the prior valuation for comparison.

| Service | Rate of Withdrawal |
|---|---|
| 0 | 15% |
| 1 | 12% |
| 2 | 10% |
| 3 | 9% |
| 4 | 8% |
| 5 | 7.6% |
| 10 | 5.4% |
| 15 | 3.3% |
| 20 | 2.0% |
| 25 | 1.0% |
| 30+ | 0.0% |

## Actuarial Methods and Assumptions (Continued)

### Disability Prior to Retirement

The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability:

| Age | Rate of Disability |
|---|---|
| 20 | 0.01% |
| 25 | 0.02% |
| 30 | 0.03% |
| 35 | 0.06% |
| 40 | 0.10% |
| 45 | 0.15% |
| 50 | 0.19% |
| 55 | 0.24% |
| 60 | 0.28% |

### Mortality

Pri-2012 White Collar mortality table projected using MP-2021 (sex-distinct). During employment the healthy employee mortality table is used. Post-employment the healthy annuitant table is used. The prior valuation used MP-2016 projection.

Mortality for disabled retirees follows the same table as non-disabled retirees, set forward 2 years. Death is assumed to be due to the same cause as the disability 40% of the time.

## Actuarial Methods and Assumptions (Continued)

### Rates of Retirement

The rates shown at the following ages illustrate the assumption regarding the incidence of retirement, once the member has achieved 10 years of service, including prior and current rates for comparison:

| | Prior Assumption | | | | Current Assumption | | | |
|---|---|---|---|---|---|---|---|---|
| Age | Male | Female | Hired after 4/1/12 | | Male | Female | Hired after 4/1/12 | |
| | | | Male | Female | | | Male | Female |
| 50 | 1% | 1.5% | 0% | 0% | 1.5% | 1.5% | 0% | 0% |
| 51 | 1% | 1.5% | 0% | 0% | 1.5% | 1.5% | 0% | 0% |
| 52 | 1% | 2.0% | 0% | 0% | 1.5% | 1.5% | 0% | 0% |
| 53 | 1% | 2.5% | 0% | 0% | 1.5% | 1.5% | 0% | 0% |
| 54 | 2% | 2.5% | 0% | 0% | 1.5% | 1.75% | 0% | 0% |
| 55 | 2% | 5.5% | 0% | 0% | 1.75% | 2.5% | 0% | 0% |
| 56 | 2.5% | 6.5% | 0% | 0% | 1.75% | 2.5% | 0% | 0% |
| 57 | 2.5% | 6.5% | 0% | 0% | 2% | 2.75% | 0% | 0% |
| 58 | 5% | 6.5% | 0% | 0% | 2.5% | 3% | 0% | 0% |
| 59 | 6.5% | 6.5% | 0% | 0% | 3% | 3.25% | 0% | 0% |
| 60 | 12% | 5% | 25% | 30% | 9% | 7.5% | 25% | 30% |
| 61 | 20% | 13% | 20% | 13% | 11% | 10% | 11% | 10% |
| 62 | 30% | 15% | 30% | 15% | 15% | 15% | 15% | 15% |
| 63 | 25% | 12.5% | 25% | 12.5% | 15% | 15% | 15% | 15% |
| 64 | 22% | 18% | 22% | 18% | 16% | 15% | 16% | 15% |
| 65 | 40% | 15% | 40% | 15% | 20% | 20% | 20% | 20% |
| 66 | 25% | 20% | 25% | 20% | 10% | 10% | 10% | 10% |
| 67 | 25% | 20% | 25% | 20% | 10% | 10% | 10% | 10% |
| 68 | 30% | 25% | 30% | 25% | 10% | 10% | 10% | 10% |
| 69 | 30% | 20% | 30% | 20% | 10% | 10% | 10% | 10% |
| 70 | 100% | 100% | 100% | 100% | 20% | 20% | 20% | 20% |
| 71 | 100% | 100% | 100% | 100% | 20% | 20% | 20% | 20% |
| 72 | 100% | 100% | 100% | 100% | 20% | 20% | 20% | 20% |
| 73 | 100% | 100% | 100% | 100% | 20% | 20% | 20% | 20% |
| 74 | 100% | 100% | 100% | 100% | 20% | 20% | 20% | 20% |
| 75 | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

## Appendix B – Summary of Principal Provisions

### 1. PARTICIPANT

Participation is mandatory for all full-time employees whose employment commences before age 65.

### 2. MEMBER CONTRIBUTIONS

Member contributions vary depending upon date hired as follows:

| Date of Hire | Member Contribution Rate |
|---|---|
| Prior to 1975 | 5% of Pay |
| 1975 – 1983 | 7% of Pay |
| 1984 – June 30, 1996 | 8% of Pay |
| After June 30, 1996 | 9% of Pay |

Members hired after 1978 contribute an additional 2% of pay over $30,000.

### 3. PAY

#### a. Pay

Gross regular compensation excluding bonuses, overtime, severance pay, unused sick pay, and other similar compensation.

#### b. Average Pay

The average of pay during the three consecutive years that produce the highest average or, if greater, during the last three years (whether or not consecutive) preceding retirement. For members hired after April 1, 2012, five-year averages will be used.

### 4. CREDITED SERVICE

Period during which an employee contributes to the retirement system plus certain periods of military service and "purchased" service.

## Summary of Principal Provisions (Continued)

### 5. SERVICE RETIREMENT

#### a. Eligibility

Hired prior to April 2, 2012:

- Attainment of age 55 and completion of ten years of credited service,
- or at any age with completion of 20 years of service.
- If hired prior to 1978 or a member of Group 4, the completion of ten years of service is not required.

Hired after April 1, 2012:

- Group 1 – Age 60 and Completion of 10 years of credited service;
- Group 2 – Age 55 and completion of 10 years of service;
- Group 4 – Age 55.

#### b. Retirement Allowance

Determined as the product of the member's benefit percentage, average pay and credited service, where the benefit percentage is shown below (maximum allowance of 80% of average pay):

| Benefit Percentage | Hired before April 2, 2012 |
|---|---|
| 2.5% | 65+ |
| 2.4 | 64 |
| 2.3 | 63 |
| 2.2 | 62 |
| 2.1 | 61 |
| 2.0 | 60 |
| 1.9 | 59 |
| 1.8 | 58 |
| 1.7 | 57 |
| 1.6 | 56 |
| 1.5 | 55 |
| | Hired after April 1, 2012* |
| 2.5% | 67+ |
| 2.35 | 66 |
| 2.20 | 65 |
| 2.05 | 64 |
| 1.90 | 63 |
| 1.75 | 62 |
| 1.60 | 61 |
| 1.45 | 60 |

## Summary of Principal Provisions (Continued)

### 6. DEFERRED VESTED RETIREMENT

#### a. Eligibility

Completion of 10 years of credited service (for elected and appointed members, 6 years in the event of involuntary termination).

#### b. Retirement Allowance

Determined in the same manner as "Service Retirement" section above with the member eligible to start collecting a benefit at age 55, (or age 57 for post-April 1, 2012 hires) or defer until later at his or her discretion. If a member chooses, his or her contributions with interest may be withdrawn. The amount of interest he or she will receive depends on length of service and whether or not the termination of employment was voluntary.

### 7. ORDINARY DISABILITY RETIREMENT

#### a. Eligibility

Non-job related disability after completion of 10 years of credited service.

#### b. Retirement Allowance

Determined in the same manner as "Service Retirement" section and calculated as if the member had attained age 55 (or age 57 for those hired after April 1, 2012), if younger. Veterans receive 50% of pay (during final year) plus an annuity based on accumulated member contributions with interest.

### 8. ACCIDENTAL DISABILITY RETIREMENT

#### a. Eligibility

Disabled as a result of an accident in the performance of duties. No age or service requirement.

#### b. Retirement Allowance

72% of pay plus an annuity based on accumulated member contributions with interest. Also, a dependent's allowance per year for each child. Total allowance not to exceed 100% of pay (75% for members hired after 1987).

## Summary of Principal Provisions (Continued)

### 9. NON-OCCUPATIONAL DEATH

#### a. Eligibility

Dies while in active service, but not due to occupational injury. 2 years of service.

#### b. Retirement Allowance

Benefit as if Option C had been elected (see below) and member had attained age 55 (or age 57 for those hired after April 1, 2012) if younger.

Minimum monthly benefits provided as follows:

- spouse - $500,
- first child - $120,
- each additional child - $90

### 10. OCCUPATIONAL DEATH

#### a. Eligibility

Dies as a result of an occupational injury.

#### b. Benefit Amount

72% of pay plus refund of annuity savings fund balance. In the case of an accidental disability retiree who dies of the same cause, the beneficiary receives 72% of the last 12 months salary or the current pension amount, whichever is greater.

### 11. COST-OF-LIVING INCREASES

An increase of up to 3% applied to the first $17,000 of annual benefit for 2023, increasing to $18,000 in 2024. Percentage increase is voted on each year by the Retirement Board.

### 12. OPTIONAL FORMS OF PAYMENT

- Option A: Allowance payable monthly for the life of the member.
- Option B: Allowance payable monthly for the life of the member with a guarantee of remaining member contributions with interest.
- Option C: Allowance payable monthly for the life of the member with 66-2/3% continuing to the member's beneficiary upon the member's death. If the beneficiary predeceases the member, the allowance amount "pops up" to the non-reduced amount.

## Appendix C – Glossary of Terms

- **Actuarial Accrued Liability**
  The portion of the Present Value of Benefits that is attributable to past service.

- **Actuarial Value of Assets**
  The value of assets based on the asset valuation method shown in the Actuarial Methods and Assumptions section of this report.

- **Actuarial Assumptions**
  Estimates are made as to the occurrence of certain events that determine the level of benefits to be paid and how long they will be provided. The more important actuarial assumptions include the investment return on assets, salary increases and the rates of turnover, disability, retirement and mortality.

- **Actuarial Cost Method**
  The procedure that is used to allocate the present value of benefits between the liability that is attributable to past service (Actuarial Accrued Liability) and that attributable to future service.

- **Funding Ratio**
  The percentage of the accrued liability that is covered by the Actuarial Value of Assets.

- **GASB**
  Government Accounting Standards Board (issues guidance for disclosure of retirement system liabilities).

- **Normal Cost**
  The portion of the Present Value of Benefits that is attributable to benefits to be earned in the coming year.

- **PERAC**
  Public Employee Retirement Administration Commission, a division of the State government which has regulatory authority over the administration of the retirement system.

- **Present Value of Benefits**
  Represents the dollar value today of all benefits expected to be earned by current members if all actuarial assumptions are exactly realized.

- **PRIT**
  Pension Reserves Investment Trust Fund is the state controlled and administered fund for the investment of assets for members of the retirement system.

- **Unfunded Actuarial Accrued Liability**
  That portion of the Actuarial Accrued Liability not covered by System Assets.

## PERAC Information Disclosure

The most recent actuarial valuation of the System was prepared by Stone Consulting, Inc. as of January 1, 2023

| | | |
|---|---|---|
| The normal cost for employees on that date was: | $3,627,083 | 9.8% of payroll |
| The normal cost for the employer was: | $723,589 | 2.0% of payroll |

| | |
|---|---|
| The actuarial liability for active members was: | $116,493,478 |
| The actuarial liability for retired members was (includes inactives): | $119,171,839 |
| Total actuarial accrued liability: | $235,665,317 |
| System assets as of that date ($219,758,812.87 Market Value): | $219,758,813 |
| Unfunded actuarial accrued liability: | $15,906,504 |

| | |
|---|---|
| The ratio of system's assets to total actuarial liability was: | 93% |

| | |
|---|---|
| As of that date the total covered employee payroll was: | $36,887,015 |

The principal actuarial assumptions used in the valuation are as follows:

| | |
|---|---|
| Investment Return: | 7.00% per annum |
| Rate of Salary Increase: | Select and ultimate rate (3.75% ultimate rate) |

### SCHEDULE OF FUNDING PROGRESS (Dollars in $000's)

| Actuarial Valuation Date | Actuarial Value of Assets (a) | Actuarial Accrued Liability (AAL) (b) | Unfunded AAL (UAAL) (b-a) | Funded Ratio (a/b) | Covered Payroll (c) | UAAL as a % of Covered Payroll ((b-a)/c) |
|---|---|---|---|---|---|---|
| 1/1/2023 | $219,759 | $235,665 | $15,906 | 93% | $36,887 | 43% |
| 1/1/2021 | $206,777 | $218,233 | $11,456 | 95% | $33,980 | 34% |
| 1/1/2019 | $146,119 | $196,460 | $50,341 | 74% | $33,018 | 152% |
| 1/1/2017 | $128,397 | $167,145 | $38,749 | 77% | $32,022 | 121% |
| 1/1/2015 | $113,875 | $144,536 | $30,661 | 79% | $31,240 | 98% |