Newton Contributory Retirement System

Actuarial Valuation and Review as of January 1, 2025

Segal

Segal

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June 12, 2025

Retirement Board
Newton Contributory Retirement System
1000 Commonwealth Ave
Newton Centre, MA 02459-1449

Dear Board Members:

We are pleased to submit this Actuarial Valuation and Review as of January 1, 2025. It summarizes the actuarial data used in the valuation, analyzes the preceding year's experience, and establishes the funding requirements for fiscal 2026 and later.

This report has been prepared in accordance with generally accepted actuarial principles and practices for the exclusive use and benefit of the Board, based upon information provided by the staff of the Newton Contributory Retirement System and the Newton Contributory Retirement System's other service providers.

Segal does not audit the data provided. The accuracy and comprehensiveness of the data is the responsibility of those supplying the data. To the extent we can, however, Segal does review the data for reasonableness and consistency. Based on our review of the data, we have no reason to doubt the substantial accuracy of the information on which we have based this report and we have no reason to believe there are facts or circumstances that would affect the validity of these results.

The measurements shown in this actuarial valuation may not be applicable for other purposes. Future actuarial measurements may differ significantly from the current measurements presented in this report due to such factors as the following: 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 the natural operation of the methodology used for these measurements; and changes in plan provisions or applicable law.

The actuarial calculations were directed under my supervision. I am a member of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion herein. To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate. The assumptions used in this actuarial valuation were selected by the Board based upon our analysis and recommendations. In my opinion, the assumptions are reasonable and take into

account the experience of the Newton Contributory Retirement System and reasonable expectations. In addition, in my opinion, the combined effect of these assumptions is expected to have no significant bias.

Segal makes no representation or warranty as to the future status of the Newton Contributory Retirement System and does not guarantee any particular result. This document does not constitute legal, tax, accounting or investment advice or create or imply a fiduciary relationship. The Board is encouraged to discuss any issues raised in this report with the Newton Contributory Retirement System's legal, tax and other advisors before taking, or refraining from taking, any action.

We look forward to reviewing this report at your next meeting and to answering any questions.

Sincerely,

Segal

Kathleen A. Riley, FSA, MAAA, EA
Senior Vice President and Chief Actuary

Table of Contents

Table of Contents

Section 1: Actuarial Valuation Summary

Purpose and basis

This report has been prepared by Segal to present a valuation of the Newton Contributory Retirement System as of January 1, 2025. The valuation was performed to determine whether the assets and contributions are sufficient to provide the prescribed benefits. .

The contribution requirements presented in this report are based on:

- The benefit provisions of Massachusetts General Law Chapter 32;
- The characteristics of covered active participants, inactive participants, and retired participants and beneficiaries as of December 31, 2024, provided by the staff of the Retirement System;
- The assets of the Retirement System as of December 31, 2024, provided by the staff of the Retirement System;
- Economic assumptions regarding future salary increases and investment earnings; and
- Other actuarial assumptions regarding employee terminations, retirement, death, etc.

Certain disclosure information required by GASB Statements No. 67 and 68 as of December 31, 2024 for the Newton Contributory Retirement System is provided in a separate report.

Valuation highlights

- Segal strongly recommends an actuarial funding method that targets 100% funding of the actuarial accrued liability. Generally, this implies payments that are ultimately at least enough to cover normal cost, interest on the unfunded actuarial accrued liability and the principal balance. The funding policy adopted by the Newton Contributory Retirement System meets this standard and funds the unfunded actuarial accrued liability by June 30, 2032.
- The rate of return on the market value of assets was 8.89% for the year ending December 31, 2024. The return on the actuarial value of assets was 7.01% for the same period due to the recognition of prior years' investment gains and losses. This resulted in an actuarial gain when measured against the assumed rate of return of 6.90%.
- The actuarial value of assets is 99.68% of the market value of assets. The investment experience in the past years has only been partially recognized in the actuarial value of assets. The deferred gain will be recognized in future years. The deferred gain is not reflected in the funding schedule shown in Section 2.
- The following actuarial assumptions were approved by the Board and changed with this valuation:
  - The administrative expense assumption was increased from $427,000 for 2024 to $465,000 for 2025.
  - The allowance for net 3(8)(c) payments was increased from $228,000 for 2024 to $310,000 for 2025.
- The unfunded actuarial accrued liability was expected to decrease by $18.9 million from $300.7 million as of January 1, 2024 to $281.8 million as of January 1, 2025. The actual unfunded liability of $277.8 million is $4.0 million lower due to an experience gain discussed on Section 2.
- The funded ratio (the ratio of the actuarial value of assets to actuarial accrued liability) is 67.81%, compared to the prior year funded ratio of 64.18%. This ratio is one measure of funding status, and its history is a measure of funding progress. Using the market value of assets, the funded ratio is 68.03%, compared to 63.27% as of the prior valuation date. These measurements are not necessarily appropriate for assessing the sufficiency of the plan assets to cover the estimated cost of settling the System's benefit obligation or the need for or the amount of future contributions.
- The funding schedule included in this report shows a projection of the actuarially determined contribution. The fiscal 2026 appropriation has been set equal to the previously budgeted amount. The funding schedule fully funds the System by June 30, 2032 if all assumptions are met and there are no changes in the plan of benefits or actuarial assumptions. The appropriation increases 6.60% per year with a smaller appropriation in fiscal 2032.
- Actuarial Standard of Practice No. 4 (ASOP 4), *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*, requires the disclosure of the impact of smoothing the increases in the appropriation over the years remaining on the funding schedule and the disclosure of a Low-Default-Risk Obligation Measure (LDROM) when performing a funding valuation. This additional information is included in Section 2.

Risk

- It is important to note that this actuarial valuation is based on plan assets as of December 31, 2024. The Retirement System's funded status does not reflect short-term economic fluctuations, but rather is based on the market values on the last day of the plan year. Segal is available to prepare projections of potential outcomes of market conditions and other demographic experience upon request.
- Since the actuarial valuation results are dependent on a given set of assumptions, there is a risk that emerging results may differ significantly as actual experience proves to be different from the assumptions. We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the retirement System's future financial condition, but have included a brief discussion of some risks that may affect the Retirement System in Section 2. A more detailed assessment would provide the System with a better understanding of the inherent risks.

Summary of key valuation results

Valuation Result	Current	Prior
Contributions for fiscal year beginning	**July 1, 2025**	**July 1, 2024**
• Actuarially determined contributions	$49,480,511	$46,416,990
Actuarial accrued liability for plan year beginning:	**January 1, 2025**	**January 1, 2024**
• Retired participants and beneficiaries	$484,372,833	$472,168,267
• Inactive vested participants	7,945,587	7,469,936
• Inactive participants due a refund of employee contributions	5,708,461	5,212,333
• Active participants	364,969,157	354,690,219
• **Total**	**$862,996,038**	**$839,540,755**
• Normal cost including administrative expenses and allowance for net 3(8)(c) payments for plan year beginning January 1	20,906,758	20,245,690
Assets for plan year beginning January 1:		
• Market value of assets (MVA)	$587,076,617	$531,200,282
• Actuarial value of assets (AVA)	585,220,183	538,847,148
• Actuarial value of assets as a percentage of market value of assets	99.68%	101.44%
Funded status for plan year beginning January 1:		
• Unfunded actuarial accrued liability on market value of assets	$275,919,421	$308,340,473
• Funded percentage on MVA basis	68.03%	63.27%
• Unfunded actuarial accrued liability on actuarial value of assets	$277,775,855	$300,693,607
• Funded percentage on AVA basis	67.81%	64.18%

Section 1: Actuarial Valuation Summary

Valuation Result	Current	Prior
Key assumptions:		
• Net investment return	6.90%	6.90%
• Inflation rate	2.75%	2.75%
Demographic data for plan year beginning January 1:		
• Number of retired participants and beneficiaries	1,343	1,356
• Number of inactive vested participants	57	52
• Number of inactive participants due a refund of employee contributions	636	559
• Number of active participants	1,773	1,730
• Average compensation[1]	$75,162	$73,214

[1] Compensation figures are for the prior year and reflect annualized salaries for participants hired during the year.
Calendar year 2024 compensation figures were decreased by 0.8333% for school clerical and teacher aides to reflect retroactive payments. Figures were increased by 2.5% for engineering, parking control clerks, and teamsters, 7.5% for custodians, and 17.5% for patrolmen to reflect unsettled bargaining contracts.
Calendar year 2023 compensation figures were decreased by 13.5% for parking control clerks to reflect retroactive payments. Figures were increased by 1.5% for superior officers, 12.5% for patrolmen, 1.6667% for clerical, and 2.5% for teacher aides, nurses, and custodians to reflect unsettled bargaining contracts.

Important information about actuarial valuations

An actuarial valuation is a budgeting tool with respect to the financing of future projected obligations of a pension plan. It is an estimated forecast – the actual long-term cost of the plan will be determined by the actual benefits and expenses paid and the actual investment experience of the plan.

In order to prepare a valuation, Segal relies on a number of input items. These include:

Input Item	Description
Plan provisions	Plan provisions define the rules that will be used to determine benefit payments, and those rules, or the interpretation of them, may change over time. Even where they appear precise, outside factors may change how they operate. It is important to keep Segal informed with respect to plan provisions and administrative procedures, and to review the plan summary included in our report to confirm that Segal has correctly interpreted the plan of benefits.
Participant information	An actuarial valuation for a plan is based on data provided to the actuary by the Retirement System. Segal does not audit such data for completeness or accuracy, other than reviewing it for obvious inconsistencies compared to prior data and other information that appears unreasonable. It is important for Segal to receive the best possible data and to be informed about any known incomplete or inaccurate data.
Financial information	Part of the cost of a plan will be paid from existing assets — the balance will need to come from future contributions and investment income. The valuation is based on the asset values as of the valuation date, typically reported by the Retirement system. A snapshot as of a single date may not be an appropriate value for determining a single year's contribution requirement, especially in volatile markets. Plan sponsors often use an "actuarial value of assets" that differs from market value to gradually reflect year-to-year changes in the market value of assets in determining the contribution requirements.
Actuarial assumptions	In preparing an actuarial valuation, Segal starts by developing a forecast of the benefits to be paid to existing plan participants for the rest of their lives and the lives of their beneficiaries. This requires actuarial assumptions as to the probability of death, disability, withdrawal, and retirement of participants in each year, as well as forecasts of the plan's benefits for each of those events. In addition, the benefits forecasted for each of those events in each future year reflect actuarial assumptions as to salary increases and cost-of-living adjustments. The forecasted benefits are then discounted to a present value, typically based on an estimate of the rate of return that will be achieved on the plan's assets. All of these factors are uncertain and unknowable. Thus, there will be a range of reasonable assumptions, and the results may vary materially based on which assumptions are selected within that range. That is, there is no right answer (except with hindsight). It is important for any user of an actuarial valuation to understand and accept this constraint. The actuarial model may use approximations and estimates that will have an immaterial impact on our results. In addition, the actuarial assumptions may change over time, and while this can have a significant impact on the reported results, it does not mean that the previous assumptions or results were unreasonable or wrong.

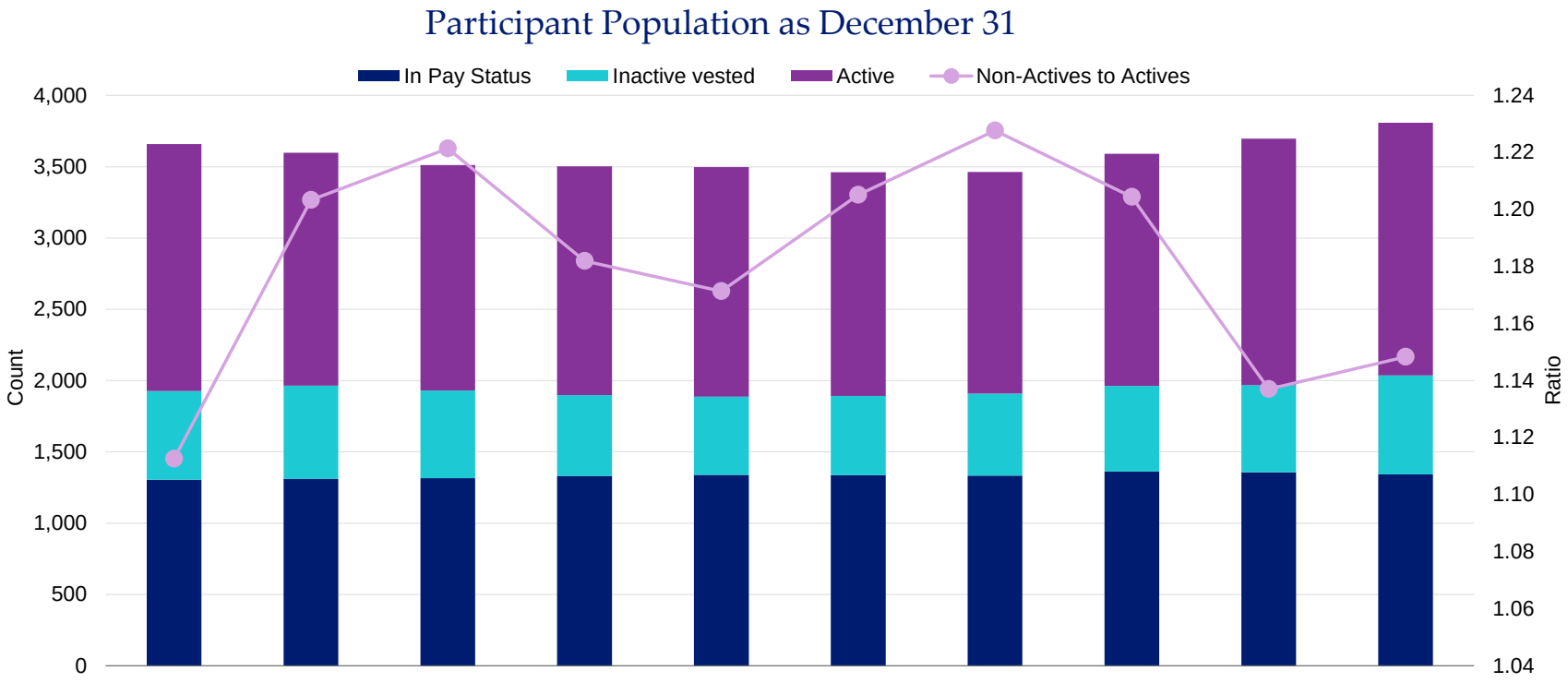
Section 1: Actuarial Valuation Summary

The user of Segal's actuarial valuation (or other actuarial calculations) should keep the following in mind:

- The actuarial valuation is prepared at the request of the Retirement Board. Segal is not responsible for the use or misuse of its report, particularly by any other party.
- An actuarial valuation is a measurement at a specific date — it is not a prediction of a plan's future financial condition. Accordingly, Segal did not perform an analysis of the potential range of financial measurements, except where otherwise noted.
- If the Retirement Board is aware of any event or trend that was not considered in this valuation that may materially change the results of the valuation, Segal should be advised, so that we can evaluate it.
- Segal does not provide investment, legal, accounting, or tax advice and is not acting as a fiduciary to the Newton Contributory Retirement System. The valuation is based on Segal's understanding of applicable guidance in these areas and of the Newton Contributory Retirement System's provisions, but they may be subject to alternative interpretations. The Retirement Board should look to their other advisors for expertise in these areas.
- While Segal maintains extensive quality assurance procedures, an actuarial valuation involves complex computer models and numerous inputs. In the event that an inaccuracy is discovered after presentation of Segal's valuation, Segal may revise that valuation or make an appropriate adjustment in the next valuation.
- Segal's report shall be deemed to be final and accepted by the Retirement Board upon delivery and review. The Board should notify Segal immediately of any questions or concerns about the final content.

Section 2: Actuarial Valuation Results

Participant information



Legend	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
In Pay Status	1,305	1,310	1,315	1,332	1,339	1,337	1,334	1,362	1,356	1,343
Inactive Vested[1]	622	655	616	565	548	555	575	600	611	693
Active	1,732	1,633	1,581	1,605	1,611	1,570	1,555	1,629	1,730	1,773
Ratio	1.11	1.20	1.22	1.18	1.17	1.21	1.23	1.20	1.14	1.15

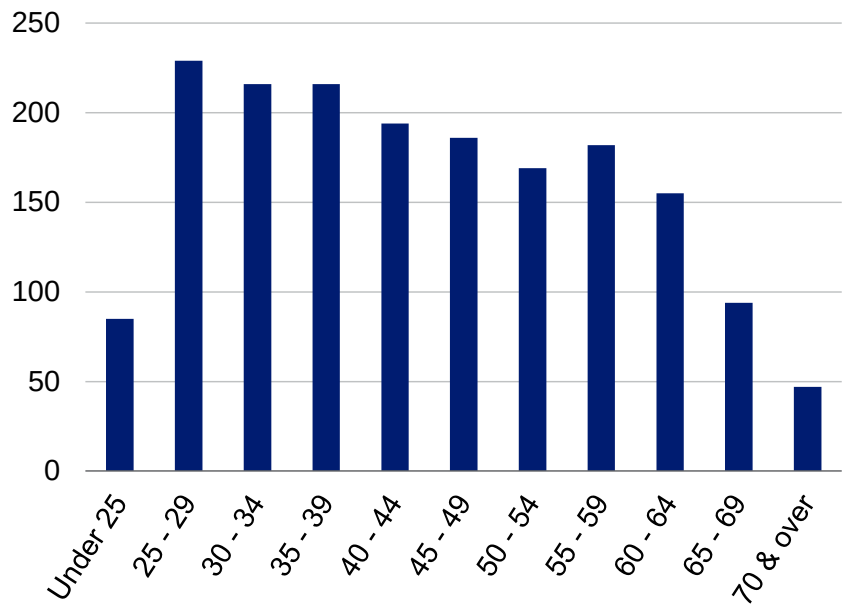
[1] Including terminated participants due a refund of employee contributions.

Active participants

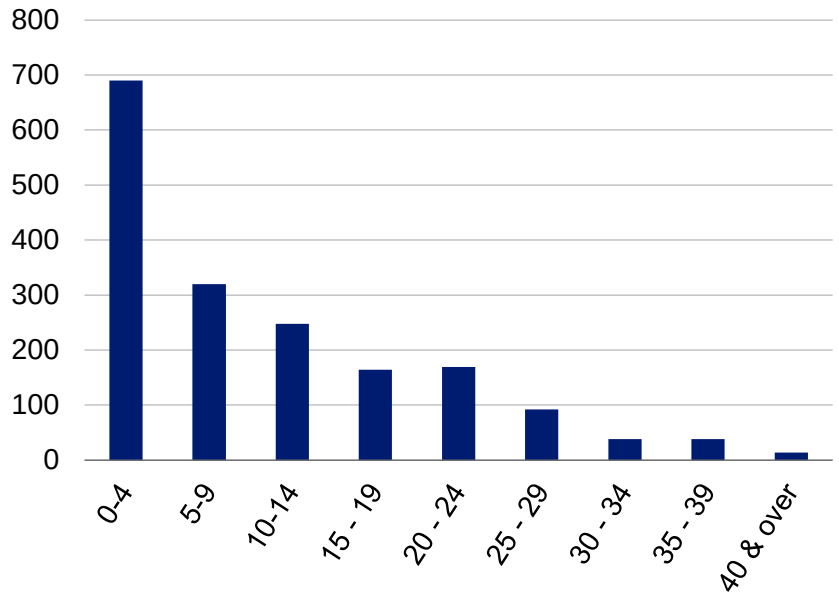
Demographic Data	December 31, 2024	December 31, 2023	Change
Active participants	1,773	1,730	2.5%
Average age	44.7	45.2	-0.5
Average years of service	10.7	10.9	-0.2
Average compensation	$75,162	$73,214	2.7%

Distribution of Active Participants as of December 31, 2024

Actives by Age



Actives by Years of Service



Inactive participants

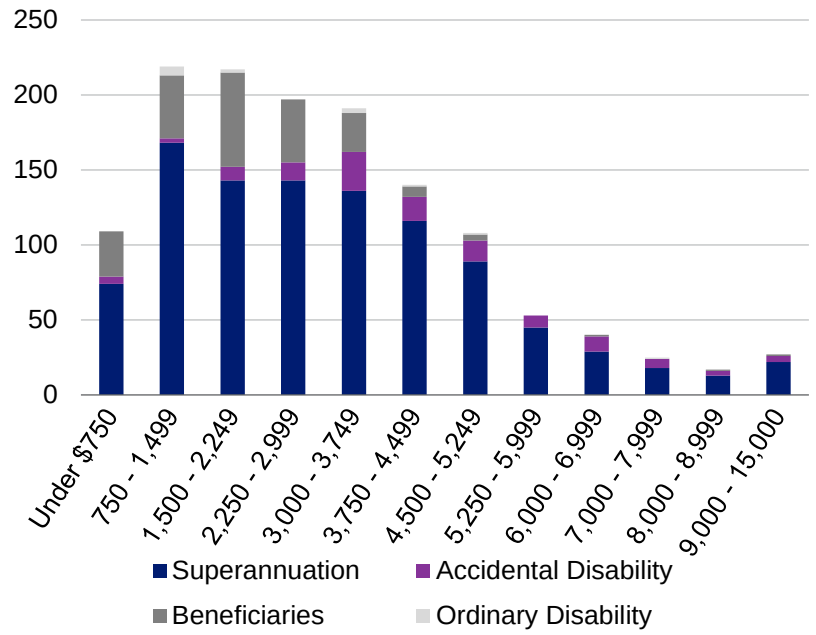
In this year's valuation, there were 57 inactive participants with a vested right to a deferred or immediate vested benefit. In addition, there were 636 inactive participants entitled to a return of their employee contributions.

Retired participants and beneficiaries

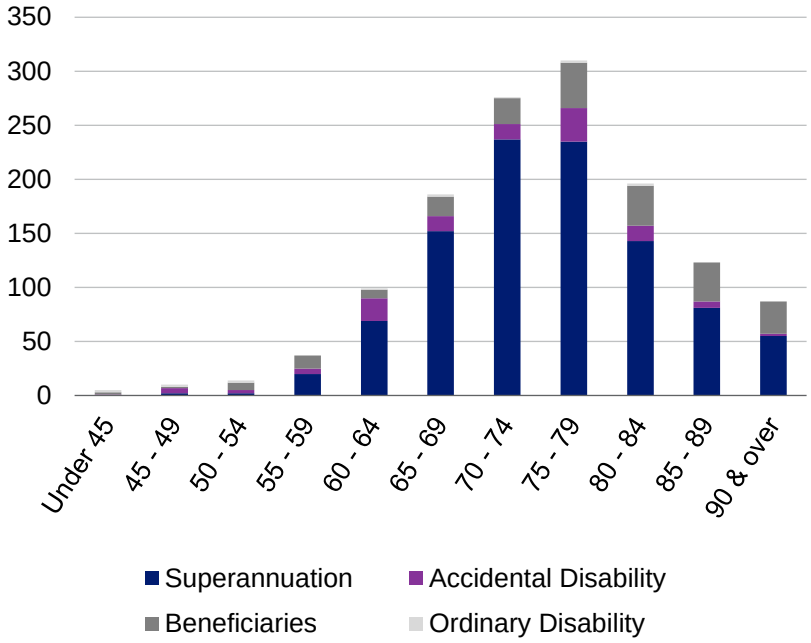
Demographic Data	December 31, 2024	December 31, 2023	Change
Retired participants	1,126	1,133	-0.6%
Beneficiaries	217	223	-2.7%
Average age	75.1	74.9	0.2
Average amount[1]	$3,073	$2,950	4.2%
Total monthly amount[1]	4,126,404	3,999,961	3.2%

Distribution of Retired Participants and Beneficiaries as of December 31, 2024

By Type and Monthly Amount



By Type and Age

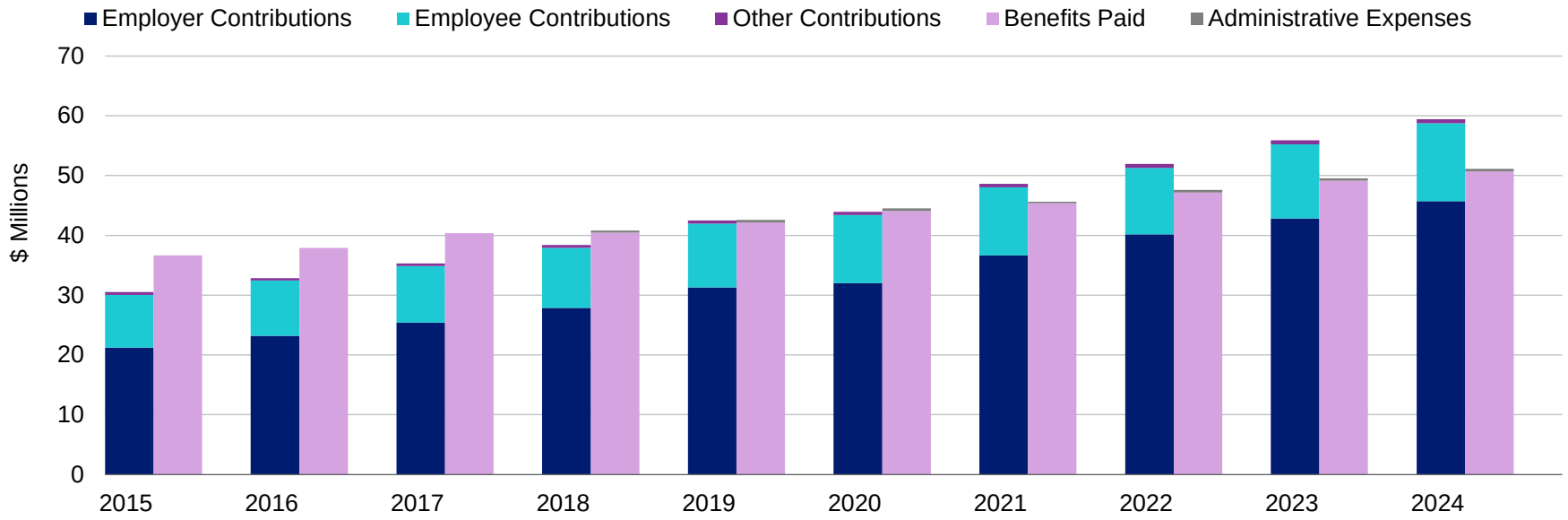


[1] Excludes COLAs reimbursed by the Commonwealth.

Financial information

Retirement plan funding anticipates that, over the long term, both contributions (less administrative expenses) and investment earnings (less investment fees) will be needed to cover benefit payments. Retirement plan assets change as a result of the net impact of these income and expense components.

Comparison of Contributions with Benefits and Expenses for Years Ended December 31



Note:

Excludes administrative expenses and administrative expense appropriation prior to 2018.

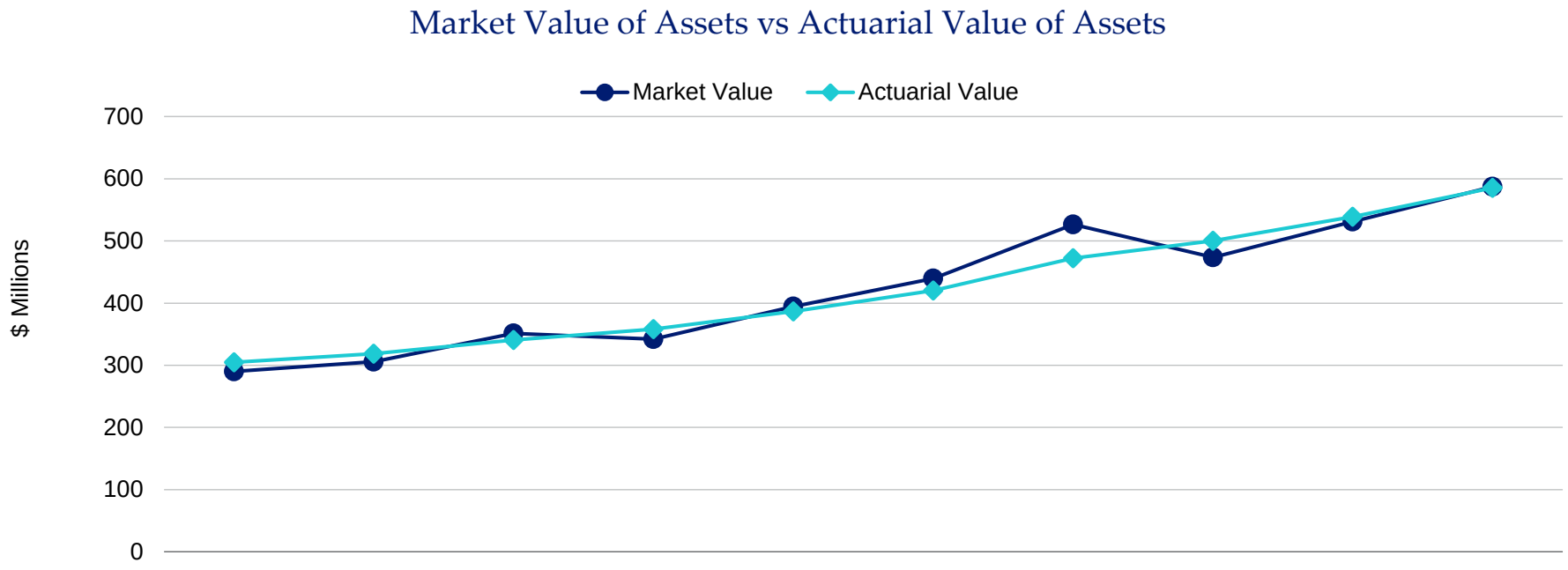
Section 2: Actuarial Valuation Results

It is desirable to have level and predictable plan costs from one year to the next. For this reason, the Board has approved an asset valuation method that gradually adjusts to market value. Under this valuation method, the full value of market fluctuations is not recognized in a single year and, as a result, the asset value and the plan costs are more stable. The amount of the adjustment to recognize market value is treated as income, which may be positive or negative. Realized and unrealized gains and losses are treated equally and, therefore, the sale of assets has no immediate effect on the actuarial value.

Determination of Actuarial Value of Assets for Year Ended December 31, 2024

	Determination	Current
1.	Actuarial value of assets as of December 31, 2023	$538,847,148
2.	Contributions less benefit payments and expenses	8,287,840
3.	Expected investment income on (1) and (2)	37,466,384
4.	**Preliminary actuarial value of assets: (1) + (2) + (3)**	**$584,601,372**
5.	Market value of assets, December 31, 2024	587,076,617
6.	Adjustment toward market value: 25% of [(5) - (4)]	618,811
7.	Adjustment to be within 20% corridor	0
8.	**Final actuarial value of assets as of December 31, 2024: (3) + (5) + (6)**	**$585,220,183**
9.	Actuarial value as a percentage of market value: (8) ÷ (5)	99.68%
10.	Amount deferred for future recognition: (5) - (8)	1,856,434

Asset history for years ended December 31

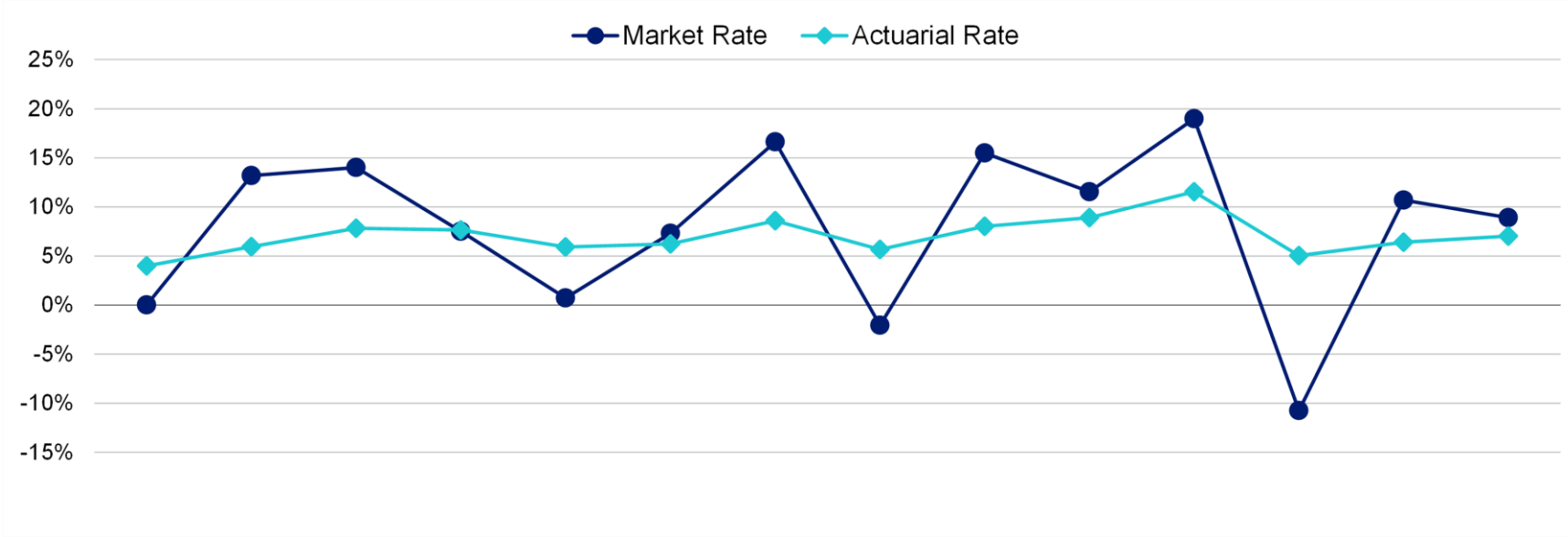


Legend	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Actuarial value[1]	$304.94	$318.75	$340.84	$357.99	$386.55	$420.40	$472.06	$500.28	$538.85	$585.22
Market value[1]	289.93	305.87	351.18	341.84	394.68	439.66	526.33	473.82	531.20	587.08

[1] In $ millions

Historical investment returns

Market and Actuarial Rates of Return versus Assumed Rate for Years Ended December 31



Legend	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Market rate	0.74%	7.30%	16.61%	-2.07%	15.49%	11.55%	18.97%	-10.75%	10.69%	8.89%
Actuarial rate	5.93%	6.23%	8.59%	5.67%	8.01%	8.91%	11.54%	5.04%	6.39%	7.01%
Assumed rate	7.65%	7.50%	7.25%	7.25%	7.25%	7.25%	7.25%	6.90%	6.90%	6.90%

Average Rates of Return	Market Value	Actuarial Value
Most recent five-year average return:	7.20%	7.61%
Most recent ten-year average return:	7.35%	7.33%

Actuarial experience

Assumptions should consider experience and should be based on reasonable expectations for the future.

Each year actual experience is compared to that projected by the assumptions. Differences are reflected in the actuarial valuation.

Assumptions are not changed if experience is believed to be a short-term development that will not continue over the long term. On the other hand, if experience is expected to continue, assumptions are changed.

Actuarial Experience for Year Ended December 31, 2024

	Source	Amount
1.	Net gain from investments	$618,811
2.	Loss from administrative expenses and net 3(8)(c) allowances	-92,852
3.	Net gain from other experience	3,512,444
4.	**Net experience gain: 1 + 2 + 3 +4**	**$4,038,403**

Investment experience

Actuarial planning is long term. The obligations of a pension plan are expected to continue for the lifetime of all its participants.

The assumed long-term rate of return of 6.90% considers past experience, the asset allocation policy of the Board and future expectations.

Investment Experience for Year Ended December 31, 2024

	Item	Market Value	Actuarial Value
1.	Net investment income	$47,588,495	$38,085,195
2.	Average value of assets	535,344,202	542,991,068
3.	Rate of return: **1 ÷ 2**	8.89%	7.01%
4.	Assumed rate of return	6.90%	6.90%
5.	Expected investment income: **2 x 4**	$36,938,750	$37,466,384
6.	**Net investment gain/(loss): 1 – 5**	**$10,649,745**	**$618,811**

Non-investment experience

Administrative expenses

Administrative expenses for the year ended December 31, 2024 totaled $433,831, as compared to the assumption of $427,000. Net 3(8)(c) payments were $308,028 for the year ended December 31, 2024, as compared to the allowance of $228,000.

Other experience

There are other differences between the expected and the actual experience that appear when the new valuation is compared with the projections from the previous valuation. These include:

- Mortality experience (more or fewer than expected deaths)
- The extent of turnover among participants
- Retirement experience (earlier or later than projected)
- The number of disability retirements (more or fewer than projected)
- Salary increases (greater or smaller than projected)

The net gain from this other experience for the year ended December 31, 2024 amounted to $3,512,444, which is 0.4% of the actuarial accrued liability.

Liability Changes Due to Demographic Experience for Year Ended December 31,

Other Experience	Gain or Loss
Gain due to salaries increasing less than expected for continuing actives	$1,997,877
Miscellaneous experience gain (including changes in data)	1,514,567
Net gain	**$3,512,444**

Actuarial assumptions

The assumption changes reflected in this report are:

- The administrative expense assumption was increased from $427,000 for 2024 to $465,000 for 2025.
- The allowance for net 3(8)(c) payments was increased from $228,000 for 2024 to $310,000 for 2025.

Plan provisions

There were no changes in plan provisions since the prior valuation.

Unfunded/(overfunded) actuarial accrued liability

Development of Unfunded Actuarial Accrued Liability for Year Ended December 31, 2024

	Component	Amount
1.	Unfunded actuarial accrued liability at beginning of year	$300,693,607
2.	Normal cost at beginning of year	20,245,690
3.	Total contributions	-59,413,532
4.	Interest on 1, 2 & 3	20,288,493
5.	Expected unfunded actuarial accrued liability	281,814,258
6.	Changes due to:	
	a. Net experience (gain)/loss	-4,038,403
7.	**Unfunded/(overfunded) actuarial accrued liability at end of year**	**$277,775,855**

Actuarially determined contribution

The actuarially determined contribution is equal to the employer normal cost payment and a payment on the unfunded actuarial accrued liability. For fiscal 2025, the actuarially determined contribution has been set equal to the previously budgeted amount of $49,480,511.

The funding schedule included in this report fully funds the System by June 30, 2032, if all assumptions are met and there are no changes in the plan of benefits or actuarial assumptions. The appropriation increases 6.60% per year. The current funding schedule is intended to result in predictable employer contributions that eliminate the unfunded actuarial accrued liability within seven years, thereby providing benefit security to plan participants while balancing the need for current and future contributors to the plan.

Actuarially Determined Contribution for Years Beginning July 1, 2025 and July 1, 2024

	Component	2025 Amount	2025 Percent of Projected Payroll	2024 Amount	2024 Percent of Projected Payroll
1.	Total normal cost	$20,131,758	14.51%	$19,590,690	14.63%
2.	Administrative expenses	775,000	0.56%	655,000	0.49%
3.	Expected employee contributions	-14,083,440	-10.15%	-13,555,071	-10.12%
4.	**Employer normal cost: (1) + (2) + (3)**	**$6,823,318**	**4.92%**	**$6,690,619**	**5.00%**
5.	Actuarial accrued liability	$862,996,038		$839,540,755	
6.	Actuarial value of assets	585,220,183		538,847,148	
7.	**Unfunded actuarial accrued liability: (5) - (6)**	**277,775,855**		**300,693,607**	
8.	Employer normal cost projected to July 1, 2025 and 2024, adjusted for timing	$6,955,067	4.94%	$6,819,806	5.02%
9.	Projected unfunded actuarial accrued liability	287,199,279		310,894,506	
10.	Payment on projected unfunded actuarial accrued liability, adjusted for timing	42,525,444	30.23%	39,597,184	29.17%
11.	**Actuarially determined contribution: (8) + (10)**	**$49,480,511**	**35.18%**	**$46,416,990**	**34.19%**
12.	Projected payroll as of July 1	140,664,891		135,759,629	

Notes:
Actuarially Determined Contributions are assumed to be paid August 1.
Actuarially Determined Contributions set equal to the budgeted amount determined with the prior valuation.

Section 2: Actuarial Valuation Results

The funding policy adopted by the Board is designed to reduce the volatility of the actuarially determined contribution by increasing the total contribution by a fixed percentage per year. As noted in Section 1, ASOP 4 requires the disclosure of the impact of smoothing the increases in the appropriation over the funding schedule. If the actuarially determined contribution were determined by amortizing the projected July 1, 2025 unfunded actuarial liability over seven years as a level percentage of payroll (a 2.75% increasing amortization schedule), plus payment of the fiscal 2026 employer normal cost, the actuarially determined contribution for fiscal 2026 would increase from $49,480,511 to $53,270,623 and increase by approximately 2.75% per year thereafter.

The actuarially determined contribution under the funding policy is a “Reasonable Actuarially Determined Contribution” as required under ASOP 4.

Funding schedule

(1) Fiscal Year Ended June 30	(2) Employer Normal Cost	(3) Amortization of Unfunded Actuarial Accrued Liability	(4) Actuarially Determined Contribution (ADC): (2)+(3)	(5) Total Unfunded Actuarial Accrued Liability at Beginning of Fiscal Year	(6) Percent Increase in ADC Over Prior Year
2026	$6,955,067	$42,525,444	$49,480,511	$287,199,279	- -
2027	7,177,959	45,568,266	52,746,225	261,808,398	6.60%
2028	7,407,898	48,819,578	56,227,476	231,430,806	6.60%
2029	7,645,107	52,293,382	59,938,489	195,500,779	6.60%
2030	7,889,811	56,004,618	63,894,429	153,398,675	6.60%
2031	8,142,245	59,969,216	68,111,461	104,446,213	6.60%
2032	8,402,652	48,168,463	56,571,115	47,901,375	-16.94%
2033	8,671,279	0	8,671,279	0	-84.67%

Notes:
Fiscal 2026 Actuarially Determined Contribution is set equal to the budgeted amount.
Actuarially Determined Contributions are assumed to be paid August 1.
Item (2) reflects 2.75% growth in payroll, as well as a 0.15% adjustment to total normal cost to reflect the effect of mortality improvements due to the generational mortality assumption.
Projected normal cost does not reflect the future impact of pension reform for new hires.
Projected unfunded actuarial accrued liability does not reflect the recognition of deferred investment gains or losses.

Low-Default-Risk Obligation Measure (LDROM)

Actuarial Standard of Practice No. 4 (ASOP 4) *Measuring Pension Obligations and Determining Pension Plan Costs or Contributions*. requires the disclosure of a Low-Default-Risk Obligation Measure (LDROM) when performing a funding valuation. The LDROM presented in this report is calculated using the same methodology and assumptions used to determine the Actuarial Accrued Liability (AAL) used for funding, except for the discount rate. The LDROM is required to be calculated using "a discount rate…derived from low-default-risk fixed income securities whose cash flows are reasonably consistent with the pattern of benefits expected to be paid in the future."

The LDROM is a calculation assuming a plan's assets are invested in an all-bond portfolio, generally lowering expected long-term investment returns. The discount rate selected and used for this purpose is the Bond Buyer General Obligation 20-year Municipal Bond Index Rate, published at the end of each week. The last published rate in December of the measurement period, by The Bond Buyer (www.bondbuyer.com), is 4.08% for use effective December 31, 2024. This is the rate used to determine the discount rate for valuing reported public pension plan liabilities in accordance with Governmental Accounting Standards when plan assets are projected to be insufficient to make projected benefit payments, and the 20-year period reasonably approximates the duration of plan liabilities. The LDROM is not used to determine a plan's funded status or Actuarially Determined Contribution Rates. The plan's expected return on assets, currently 6.90%, is used for these calculations.

As of December 31, 2024, the LDROM for the system is $1,189,683,121. The difference between the plan's AAL of $862,996,038 and the LDROM can be thought of as the increase in the AAL if the entire portfolio were invested in low-default-risk securities. Alternatively, this difference could also be viewed as representing the expected savings from investing in the plan's diversified portfolio compared to investing only in low-default-risk securities.

ASOP 4 requires commentary to help the intended user understand the significance of the LDROM with respect to the funded status of the plan, plan contributions, and the security of participant benefits. In general, if plan assets were invested exclusively in low-default-risk securities, the funded status would be lower and the Actuarially Determined Contribution would be higher. While investing in a portfolio with low-default-risk securities may be more likely to reduce investment volatility and the volatility of employer contributions, it also may be more likely to result in higher employer contributions or lower benefits.

Risk

The actuarial valuation results are dependent on a single set of assumptions; however, there is a risk that emerging results may differ significantly as actual experience proves to be different from the current assumptions.

We have not been engaged to perform a detailed analysis of the potential range of the impact of risk relative to the System's future financial condition but have included a brief discussion of some risks that may affect the System.

- Economic and Other Related Risks. Potential implications for the System due to the following economic effects (that were not reflected as of the valuation date) include:
  - Volatile financial markets and investment returns lower than assumed
  - High inflationary environment impacting salary increases
- Investment Risk (the risk that returns will be different than expected)

  The market value rate of return over the last 10 years has ranged from a low of -10.75% to a high of 18.97%.
- Longevity Risk (the risk that mortality experience will be different than expected)

  The actuarial valuation includes an expectation of future improvement in life expectancy. Emerging plan experience that does not match these expectations will result in either an increase or decrease in the actuarially determined contribution.
- Contribution Risk (the risk that actual contributions will be different from actuarially determined contribution)

  Massachusetts General Law requires payment of the actuarially determined contribution. If future experience matches the current assumptions, we project the unfunded actuarial accrued liability will be paid off in seven years.
- Demographic Risk (the risk that participant experience will be different than assumed)

  Examples of this risk include:
  - Actual retirements occurring earlier or later than assumed.
  - More or less active participant turnover than assumed.
  - Disability experience greater or less than assumed.
  - Salary increases greater or less than assumed.
- There are external factors including legislative or financial reporting changes that could impact the System's funding and disclosure requirements. While we do not assume any changes in such external factors, it is important to understand that they could have significant consequences for the System.

Section 2: Actuarial Valuation Results

- Actual Experience Over the Last Ten Years

  Past experience can help demonstrate the sensitivity of key results to the System's actual experience. Over the past ten years:

  – The annual investment gain(loss) on a market value basis has ranged from a loss of $93.3 million to a gain of $51.7 million.

  – The annual non-investment gain(loss) has ranged from a loss of $7.5 million to a gain of $4.1 million.

Plan Year Ended	Market Investment Gain/(Loss)	All Other Gains /(Losses)
2015	-$5,004,220	$4,068,729
2016	-4,293,998	-6,532,277
2017	27,640,369	2,360,311
2018	-32,625,857	838,938
2019	28,153,727	-1,814,910
2020	16,971,916	-7,524,978
2021	51,695,122	3,855,302
2022	-93,286,458	-1,600,342
2023	18,085,423	-1,706,943
2024	10,649,745	3,419,592

  – The funded percentage on the actuarial value of assets has ranged from a low of 50.9% to a high of 67.8% since 2016.

Maturity Measures

- As pension plans mature, the cash needed to fulfill benefit obligations will increase over time. Therefore, cash flow projections and analysis should be performed to assure that the System's asset allocation is aligned to meet emerging pension liabilities.
- in 2024, contributions received exceeded benefits paid plus administrative expenses by $8,287,840. While this excess continues, the System is not dependent on investment returns to pay future benefits.

Section 3: Supplemental Information

Exhibit A: Table of plan demographics

Demographic Data	Year Ended December 31, 2024	Year Ended December 31, 2023	Change From Prior Year
Active participants in valuation:			
Number	1,773	1,730	2.5%
Average age	44.7	45.2	-0.5
Average years of service	10.7	10.9	-0.2
Average compensation[1]	$75,162	$73,214	2.7%
Account balances	114,871,474	109,777,703	4.6%
Inactive participants:			
Inactive vested participants	57	52	9.6%
Inactive nonvested participants due a refund	636	559	13.8%
Retired participants:			
Number in pay status	996	1,004	-0.8%
Average age	75.3	75.1	0.2
Average monthly benefit	$3,160	$3,046	3.7%
Disabled participants:			
Number in pay status	130	129	0.8%
Average age	69.8	69.4	0.4
Average monthly benefit	$4,063	$3,888	4.5%
Beneficiaries:			
Number in pay status	217	223	-2.7%
Average age	77.4	77.3	0.1
Average monthly benefit	$2,076	$1,974	5.2%

[1] Compensation figures are for the prior year and reflect annualized salaries for participants hired during the year.
Calendar year 2024 compensation figures were decreased by 0.8333% for school clerical and teacher aides to reflect retroactive payments. Figures were increased by 2.5% for engineering, parking control clerks, and teamsters, 7.5% for custodians, and 17.5% for patrolmen to reflect unsettled bargaining contracts.
Calendar year 2023 compensation figures were decreased by 13.5% for parking control clerks to reflect retroactive payments. Figures were increased by 1.5% for superior officers, 12.5% for patrolmen, 1.6667% for clerical, and 2.5% for teacher aides, nurses, and custodians to reflect unsettled bargaining contracts.

Exhibit B: Participants in active service as of December 31, 2024 by age, years of service, and average compensation

Age	Total	Years of Service 0-4	Years of Service 5-9	Years of Service 10-14	Years of Service 15 - 19	Years of Service 20 - 24	Years of Service 25 - 29	Years of Service 30 - 34	Years of Service 35 - 39	Years of Service 40 & over
Under 25	85	85	—	—	—	—	—	—	—	—
	$47,693	$47,693	—	—	—	—	—	—	—	—
25 - 29	229	212	17	—	—	—	—	—	—	—
	$52,939	$51,850	$66,525	—	—	—	—	—	—	—
30 - 34	216	136	64	16	—	—	—	—	—	—
	$65,788	$58,065	$77,486	$84,647	—	—	—	—	—	—
35 - 39	216	54	75	74	13	—	—	—	—	—
	$86,728	$64,800	$87,731	$98,417	$105,489	—	—	—	—	—
40 - 44	194	45	43	47	47	12	—	—	—	—
	$86,656	$54,684	$83,109	$99,261	$99,131	$121,034	—	—	—	—
45 - 49	186	45	28	29	28	50	6	—	—	—
	$81,683	$52,804	$64,887	$72,548	$95,350	$112,246	$102,344	—	—	—
50 - 54	169	40	30	18	14	38	27	2	—	—
	$82,738	$50,526	$71,222	$69,142	$81,432	$103,241	$120,526	$131,503	—	—
55 - 59	182	39	18	27	20	27	26	17	8	—
	$83,401	$60,866	$64,930	$79,842	$75,093	$93,147	$104,967	$113,242	$101,210	—
60 - 64	155	16	28	22	19	18	22	8	17	5
	$83,901	$46,357	$62,124	$73,909	$91,029	$84,102	$94,222	$138,372	$112,152	$113,534
65 - 69	94	13	11	11	17	17	7	8	8	2
	$73,195	$43,732	$72,331	$82,541	$76,120	$66,330	$91,205	$90,465	$79,971	$92,343
70 & over	47	5	6	4	6	7	4	3	5	7
	$65,761	$28,033	$57,868	$96,129	$71,773	$50,903	$113,724	$54,002	$63,481	$71,090
Total	**1,773**	**690**	**320**	**248**	**164**	**169**	**92**	**38**	**38**	**14**
	$75,162	**$53,804**	**$75,775**	**$87,601**	**$90,222**	**$97,637**	**$106,126**	**$110,022**	**$96,669**	**$89,285**

Note:
Compensation figures are for the prior year, annualized for new hires. Calendar year 2024 compensation figures were decreased by 0.8333% for school clerical and teacher aides to reflect retroactive payments. Figures were increased by 2.5% for engineering, parking control clerks, and teamsters, 7.5% for custodians, and 17.5% for patrolmen to reflect unsettled bargaining contracts.

Exhibit C: Summary statement of income and expenses on a market value basis

Income and Expenses for Years Ended December 31

Item	2024	2023
Contribution and other income:		
• Employer contributions	$45,736,817	$42,837,245
• Employee contributions	12,996,542	12,366,419
• Federal Grant Reimbursement	680,173	705,898
– **Total contribution income**	**$59,413,532**	**$55,909,562**
Investment income:		
• Investment income	$50,239,062	$53,389,227
• Less investment fees	-2,650,567	-2,390,048
– **Net investment income**	**$47,588,495**	**$50,999,179**
• **Total income available for benefits**	**$107,002,027**	**$106,908,741**
Less benefit payments and administrative expenses:		
• Administrative expenses	-$433,831	-$379,211
• Pensions	-50,383,833	-48,840,385
• Net 3(8)(c) reimbursements	-308,028	-309,681
– **Net benefit payments and administrative expenses**	**-$51,125,692**	**-$49,529,277**
Change in market value of assets	**$55,876,335**	**$57,379,464**
Net assets at market value at the beginning of the year	**$531,200,282**	**$473,820,818**
Net assets at market value at the end of the year	**$587,076,617**	**$531,200,282**

Exhibit D: Department breakouts

Department Code	Category	Active participants in valuation	Projected payroll for fiscal 2026	Normal Cost, including 3(8)c reimbursements for fiscal year ending 2027	Amortization of Unfunded Actuarial Accrued Liability for fiscal year ending 2027	Total Appropriation for fiscal year ending 2027
001	Information Technology	11	$1,241,261	$34,522	$303,876	$338,398
002	Human Resources	7	683,470	17,228	235,882	253,110
003	Senior Services	6	513,304	9,571	160,332	169,903
004	Financial Information Systems	7	615,094	7,470	140,585	148,055
005	Jackson Homestead	3	225,156	17,203	39,637	56,840
006	Executive	7	917,714	54,635	296,804	351,439
007	Comptroller's	6	626,823	11,259	328,658	339,917
008	Retirement	3	299,175	12,243	156,949	169,192
009	Assessing	12	1,131,756	46,848	505,572	552,420
010	Purchasing	5	467,141	26,078	187,582	213,660
011	Treasury	10	851,079	15,014	214,370	229,384
012	Law	13	1,463,466	29,325	527,252	556,577
013	City Clerk	13	940,852	32,096	155,942	188,038
014	Clerk of the Board	3	256,499	3,899	104,456	108,355
015	City Council	20	329,041	30,732	92,344	123,076
016	Building	34	2,936,311	181,711	884,816	1,066,527
017	Elections	0	0	1,413	111,334	112,747
018	Planning	23	2,088,518	71,757	363,254	435,011
018F	Planning - Federally Funded	7	506,062	18,070	190,224	208,294
018P	Community Preservation (Planning)	1	82,139	-197	22,225	22,028

Section 3: Supplemental Information

Department Code	Category	Active participants in valuation	Projected payroll for fiscal 2026	Normal Cost, including 3(8)c reimbursements for fiscal year ending 2027	Amortization of Unfunded Actuarial Accrued Liability for fiscal year ending 2027	Total Appropriation for fiscal year ending 2027
019	Fire (Group 2 & 4)	194	23,677,020	2,491,744	9,855,081	12,346,825
019A	Fire (Civilian Personnel)	5	563,185	14,335	212,575	226,910
019S	Fire (Retired under “Starck” Bill)	0	0	4,026	317,119	321,145
020	Police (Group 2 & 4)	100	11,540,923	1,186,037	5,922,729	7,108,766
020A	Police (Civilian Personnel)	33	2,760,389	29,757	722,557	752,314
020S	Police Superior Officers (Group 4)	37	6,492,159	612,420	2,981,437	3,593,857
021	Police School Traffic Supervisors	9	588,462	42,659	298,640	341,299
022	Sealer/Weights & Measures	2	188,844	13,079	49,081	62,160
023	Inspectional Services	17	1,636,596	100,932	439,805	540,737
025	Health & Human Services	43	3,263,452	99,029	1,018,801	1,117,830
026	Veterans	1	94,362	2,497	54,613	57,110
027	Library	56	3,916,050	76,511	1,517,266	1,593,777
028	School Custodian	87	6,432,767	180,569	2,214,335	2,394,904
029	School Cafeteria	1	53,788	3,155	188,808	191,963
030	School Teacher Aides	628	32,415,532	850,560	4,148,195	4,998,755
031	School Clerical	113	10,278,615	297,169	3,317,354	3,614,523
031A	School Committee	3	24,862	2,705	23,685	26,390
031B	School Use of Building (revolving)	0	0	480	37,783	38,263
031C	School Community Ed. / Summer School (revolving)	8	664,517	27,642	153,960	181,602

Section 3: Supplemental Information

Department Code	Category	Active participants in valuation	Projected payroll for fiscal 2026	Normal Cost, including 3(8)c reimbursements for fiscal year ending 2027	Amortization of Unfunded Actuarial Accrued Liability for fiscal year ending 2027	Total Appropriation for fiscal year ending 2027
031E	School Ed Ctr Preschool (revolving)	10	425,766	17,382	53,599	70,981
031N	School NSHS Preschool (revolving)	2	84,398	-123	677	554
032	Recreation	48	4,162,596	92,757	1,422,854	1,515,611
033	Engineering	0	0	3,228	266,233	269,461
034	DPW	123	9,820,413	320,160	3,172,801	3,492,961
034A	DPW-Storm Water Management	5	366,547	7,653	110,060	117,713
035	Water/Sewer (General Personnel)	0	0	1,074	84,641	85,715
035S	Sewer Personnel	21	1,886,062	33,612	746,682	780,294
035W	Water Personnel	13	1,078,881	17,209	586,659	603,868
036	Newton Housing Authority	23	2,073,844	28,824	628,142	656,966
	TOTAL	**1,773**	**$140,664,891**	**7,177,959**	**$45,568,266**	**$52,746,225**

Exhibit E: Cashflow forecast

Plan Year	MVA BOY	Administrative Expenses	Net 3(8)(c) Payments	Benefit Payments	Employee Contributions	Employer Contributions	Investment Returns	MVA EOY	Net Change in Plan Assets
2025	$587,076,617	$465,000	$310,000	$56,234,199	$14,083,440	$49,480,511	$40,707,688	$634,339,057	$47,262,440
2026	634,339,057	477,788	318,525	58,530,083	14,470,735	52,746,225	44,014,147	686,243,768	51,904,711
2027	686,243,768	490,927	327,284	60,509,232	14,868,680	56,227,476	47,659,612	743,672,093	57,428,325
2028	743,672,093	504,427	336,285	62,655,627	15,277,568	59,938,489	51,688,700	807,080,511	63,408,419
2029	807,080,511	518,299	345,533	64,474,551	15,697,702	63,894,429	56,150,507	877,484,767	70,404,256
2030	877,484,767	532,552	355,035	66,223,297	16,129,388	68,111,461	61,106,811	955,721,544	78,236,777
2031	955,721,544	547,197	364,798	67,491,441	16,572,947	56,571,115	66,076,874	1,026,539,043	70,817,499
2032	1,026,539,043	562,245	374,830	68,657,261	17,028,703	8,671,279	69,284,510	1,051,929,198	25,390,155
2033	1,051,929,198	577,707	385,138	69,732,469	17,496,992	8,948,385	71,023,274	1,078,702,535	26,773,337
2034	1,078,702,535	593,594	395,729	70,584,742	17,978,159	9,234,233	72,865,866	1,107,206,727	28,504,193
2035	1,107,206,727	609,918	406,612	71,508,312	18,472,559	9,529,096	74,826,144	1,137,509,684	30,302,957
2036	1,137,509,684	626,690	417,794	72,382,137	18,980,554	9,833,256	76,912,992	1,169,809,865	32,300,180
2037	1,169,809,865	643,924	429,283	73,189,105	19,502,519	10,147,004	79,140,714	1,204,337,789	34,527,925
2038	1,204,337,789	661,632	441,088	73,996,883	20,038,838	10,470,638	81,522,904	1,241,270,566	36,932,777
2039	1,241,270,566	679,827	453,218	74,801,857	20,589,907	10,804,468	84,071,931	1,280,801,969	39,531,403
2040	1,280,801,969	698,523	465,682	75,599,135	21,156,129	11,148,811	86,801,356	1,323,144,926	42,342,957
2041	1,323,144,926	717,732	478,488	76,528,166	21,737,923	11,503,995	89,721,085	1,368,383,543	45,238,617
2042	1,368,383,543	737,470	491,646	77,485,670	22,335,715	11,870,357	92,840,509	1,416,715,339	48,331,796
2043	1,416,715,339	757,750	505,167	78,403,966	22,949,948	12,248,246	96,175,618	1,468,422,268	51,706,929
2044	1,468,422,268	778,588	519,059	79,188,636	23,581,071	12,638,022	99,749,150	1,523,904,228	55,481,960
2045	1,523,904,228	799,999	533,333	79,911,040	24,229,551	13,040,054	103,586,262	1,583,515,722	59,611,495
2046	1,583,515,722	821,999	547,999	80,612,157	24,895,863	13,454,725	107,710,031	1,647,594,186	64,078,463
2047	1,647,594,186	844,604	563,069	81,388,350	25,580,499	13,882,426	112,140,442	1,716,401,530	68,807,344
2048	1,716,401,530	867,831	578,554	81,991,868	26,283,963	14,323,566	116,904,145	1,790,474,952	74,073,422
2049	1,790,474,952	891,696	594,464	82,680,764	27,006,772	14,778,562	122,029,334	1,870,122,696	79,647,744
2050	1,870,122,696	916,218	610,812	83,330,569	27,749,458	15,247,843	127,541,603	1,955,804,002	85,681,306
2051	1,955,804,002	941,414	627,609	83,729,758	28,512,569	15,731,856	133,479,970	2,048,229,615	92,425,613
2052	2,048,229,615	967,303	644,868	84,023,709	29,296,664	16,231,057	139,888,492	2,148,009,948	99,780,333
2053	2,148,009,948	993,903	662,602	84,397,537	30,102,322	16,745,922	146,802,937	2,255,607,087	107,597,139
2054	2,255,607,087	1,021,236	680,824	84,534,787	30,930,136	17,276,933	154,266,141	2,371,843,450	116,236,363

Notes:
Projected benefit payments are based on a closed group projection and do not include return of employee money for inactive non-vested participants.
Employee contributions, administrative expenses and net (3)(8)(c) payments are projected to increase at the 2.75% inflation assumption.
Employer contributions are as shown in the Funding Schedule in Section 2.

Section 4: Actuarial Valuation Basis

Exhibit F: Actuarial assumptions, methods and models

Net investment return

6.90%.

The net investment return assumption is a long-term estimate derived from historical data, current and recent market expectations, and professional judgment. As part of the analysis, a building block approach was used that reflects inflation expectations and anticipated risk premiums for each of the portfolio's asset classes, as well as the System's target asset allocation.

Salary increases

Year of Service	Group 1 and 2	Group 4
0	7.00%	8.00%
1	6.50%	7.50%
2	6.00%	7.00%
3	5.50%	6.50%
4	5.25%	6.00%
5	5.00%	5.50%
6	4.75%	5.25%
7	4.50%	5.00%
8	4.25%	4.75%
9	4.00%	4.50%
10	3.75%	4.25%
11+	3.50%	4.00%

Salary increases include allowance for wage inflation rate of 2.75%.

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

Cost-of-living adjustments

3.00% increase on the first $15,000 of retirement allowance.

Interest on employee contributions

3.5%

Administrative expenses

$465,000 for calendar 2025, increasing 2.75% per year (previously, $427,000 for calendar 2024, increasing 2.75% per year).

The administrative expense assumption is based on information on expected expenses provided by the Retirement System.

Allowance for net 3(8)(c) payments

$310,000 for calendar year 2025, increasing 2.75% per year (previously, $228,000 for calendar year 2024, increasing 2.75% per year). This assumption takes into account experience over the past two years (previously three years).

Mortality rates

Pre-Retirement: RP-2014 Blue Collar Employee Mortality Table projected generationally with Scale MP-2021

Healthy Retiree: RP-2014 Blue Collar Healthy Annuitant Mortality Table projected generationally with Scale MP-2021

Disabled Retiree: RP-2014 Blue Collar Healthy Annuitant Mortality Table set forward one year and projected generationally with Scale MP-2021

The mortality tables, including projection to the measurement date, reasonably reflect the projected mortality experience of the Retirement System as of the measurement date based on historical and current demographic data. As part of the analysis, a comparison was made between the actual number of retiree deaths and the projected number based on the prior years' assumptions over the five most recent valuations. The mortality tables were then adjusted to future years using generational projection under Scale MP-2021 to reflect future mortality improvement.

Termination rates(%) before retirement

Groups 1 and 2

Age	Mortality Male	Mortality Female	Disability
20	0.05%	0.02%	0.01%
25	0.06%	0.02%	0.02%
30	0.06%	0.02%	0.03%
35	0.07%	0.03%	0.06%
40	0.08%	0.04%	0.10%
45	0.13%	0.07%	0.15%
50	0.22%	0.12%	0.19%
55	0.36%	0.19%	0.24%
60	0.61%	0.27%	0.28%

Notes:
Mortality rates do not reflect generational projection.
70% of the disability rates shown represent accidental disability.
20% of the accidental disabilities will die from the same cause as the disability.
70% of the death rates shown represent accidental death.

Section 4: Actuarial Valuation Basis

Group 4

Age	Mortality Male	Mortality Female	Disability
20	0.05%	0.02%	0.10%
25	0.06%	0.02%	0.20%
30	0.06%	0.02%	0.30%
35	0.07%	0.03%	0.30%
40	0.08%	0.04%	0.30%
45	0.13%	0.07%	1.00%
50	0.22%	0.12%	1.25%
55	0.36%	0.19%	1.20%
60	0.61%	0.27%	0.85%

Notes:
Mortality rates do not reflect generational projection.
90% of the disability rates shown represent accidental disability.
60% of the accidental disabilities will die from the same cause as the disability.
90% of the death rates shown represent accidental death.

Withdrawal rates

Years of Service	Groups 1 and 2	Group 4
0	15.0%	1.5%
1	12.0%	1.5%
2	10.0%	1.5%
3	9.0%	1.5%
4	8.0%	1.5%
5	7.6%	1.5%
6	7.5%	1.5%
7	6.7%	1.5%
8	6.3%	1.5%
9	5.9%	1.5%
10	5.4%	1.5%
11	5.0%	0.0%
12	4.6%	0.0%
13	4.1%	0.0%
14	3.7%	0.0%
15	3.3%	0.0%
16 – 20	2.0%	0.0%
21 – 29	1.0%	0.0%
30+	0.0%	0.0%

The termination rates and disability rates were based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of terminations and disability retirements and the projected number based on the prior years' assumptions over the five most recent valuations.

Retirement rates

Age	Groups 1 and 2 Male	Groups 1 and 2 Female	Group 4
45 – 49	- -	- -	1.0%
50 – 51	1.0%	1.5%	2.0%
52	1.0%	2.0%	2.0%
53	1.0%	2.5%	5.0%
54	2.0%	2.5%	7.5%
55	2.0%	5.5%	30.0%[1]
56 – 57	2.5%	6.5%	10.0%
58	5.0%	6.5%	10.0%
59	6.5%	6.5%	15.0%
60	20.0%[2]	5.0%	20.0%
61	20.0%	13.0%	20.0%
62	30.0%	15.0%	25.0%
63	25.0%	12.5%	25.0%
64	22.0%	18.0%	30.0%
65	40.0%	15.0%	100.0%
66 – 67	25.0%	20.0%	- -
68	30.0%	25.0%	- -
69	30.0%	20.0%	- -
70	100.0%	100.0%	- -

Retirement rates are 0.0% if the employee is not eligible to retire.

The retirement rates were based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment. As part of the analysis, a comparison was made between the actual number of retirements by age and the projected number based on the prior year's assumptions over the five most recent valuations.

[1] Rate is 15.0% for employees hired prior to April 2, 2012 and 30.0% for employees hired on or after April 2, 2012
[2] Rate is 12% for employees hired prior to April 2, 2012 and 20.0% for employees hired on or after April 2, 2012

Retirement rates for inactive vested participants

55 for participants hired prior to April 2, 2012. For participants hired April 2, 2012 or later, 60 for Group 1, 55 for Group 2, and 50 for Group 4.

The retirement age for inactive vested participants was based on historical and current demographic data, adjusted to reflect economic conditions of the area and estimated future experience and professional judgment.

Unknown data for participants

Same as those exhibited by participants with similar known characteristics. If not specified, participants are assumed to be male.

Family composition

80% of participants are assumed to be married. None are assumed to have dependent children. Females are assumed to be three years younger than their spouses.

Benefit election

All participants are assumed to elect Option A. The benefit election reflects the fact that all benefit options are actuarially equivalent.

Toal service

Total creditable service reported in the data

2024 compensation

2024 compensation is equal to compensation provided in the data, annualized for new hires, and decreased by 0.8333% for school clerical and teacher aides to reflect retroactive payments. Compensation was increased by 2.5% for engineering, parking control clerks, and teamsters, 7.5% for custodians, and 17.5% for patrolmen to reflect unsettled bargaining contracts.

Actuarial value of assets

A preliminary actuarial value is first determined by taking the actuarial value of assets at the beginning of the year and adding assumed investment earnings (at the assumed actuarial rate of return) and the net new money during the year (contributions less benefit payments). Twenty-five percent of the difference between the market value of assets as reported in the System's Annual

Statement and the preliminary actuarial value of assets is added to the preliminary actuarial value. In order that the actuarial value not differ too significantly from the market value of assets, the final actuarial value of assets must be within 20% of the market value of assets

Actuarial cost method

Entry Age Normal Actuarial Cost Method. Entry Age is the attained age of the participant minus total creditable service. Normal Cost and Actuarial Accrued Liability are calculated on an individual basis and are allocated by salary. Normal Cost is determined using the plan of benefits applicable to each participant.

Models

Segal valuation results are based on proprietary actuarial modeling software. The actuarial valuation models generate a comprehensive set of liability and cost calculations that are presented to meet regulatory, legislative and client requirements. Deterministic cost projections are based on a proprietary forecasting model. Our Actuarial Technology and Systems unit, comprised of both actuaries and programmers, is responsible for the initial development and maintenance of these models. The models have a modular structure that allows for a high degree of accuracy, flexibility and user control. The client team programs the assumptions and the plan provisions, validates the models, and reviews test lives and results, under the supervision of the responsible actuary.

Justification for change in actuarial assumptions

Based on past experience and future expectations, the following actuarial assumptions were changed:

The administrative expense assumption was increased from $427,000 for 2024 to $465,000 for 2025.

The allowance for net 3(8)(c) payments was increased from $228,000 for 2024 to $310,000 for 2025.

Exhibit G: Summary of plan provisions

This exhibit summarizes the major provisions of the System included in the valuation. It is not intended to be, nor should it be interpreted as, a complete statement of all plan provisions.

Plan year

January 1 through December 31

Plan status

Ongoing

Retirement benefits

Employees covered by the Contributory Retirement Law are classified into one of four groups depending on job classification. Group 1 comprises most positions in state and local government. It is the general category of public employees. Group 4 comprises mainly police and firefighters. Group 2 is for other specified hazardous occupations. (Officers and inspectors of the State Police are classified as Group 3.)

For employees hired prior to April 2, 2012, the annual amount of the retirement allowance is based on the member's final three-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following table based on the age of the member at retirement:

Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.5	65 or over	60 or over	55 or over
2.4	64	59	54
2.3	63	58	53
2.2	62	57	52
2.1	61	56	51
2.0	60	55	50
1.9	59	--	49
1.8	58	--	48
1.7	57	--	47
1.6	56	--	46
1.5	55	--	45

A member's final three-year average salary is defined as the greater of the highest consecutive three-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last three years of creditable service prior to retirement.

For employees hired on April 2, 2012 or later, the annual amount of the retirement allowance is based on the member's final five-year average salary multiplied by the number of years and full months of creditable service at the time of retirement and multiplied by a percentage according to the following tables based on the age and years of creditable service of the member at retirement:

For Members with Less Than 30 Years of Creditable Service or Greater Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.50	67 or over	62 or over	57 or over
2.35	66	61	56
2.20	65	60	55
2.05	64	59	54
1.90	63	58	53
1.75	62	57	52
1.60	61	56	51
1.45	60	55	50

For Members with 30 Years of Creditable Service or Greater Age Last Birthday at Date of Retirement

Percent	Group 1	Group 2	Group 4
2.500	67 or over	62 or over	57 or over
2.375	66	61	56
2.250	65	60	55
2.125	64	59	54
2.000	63	58	53
1.875	62	57	52
1.750	61	56	51
1.625	60	55	50

A member's final five-year average salary is defined as the greater of the highest consecutive five-year average annual rate of regular compensation and the average annual rate of regular compensation received during the last five years of creditable service prior to retirement.

For employees who became members after January 1, 2011, regular compensation is limited to 64% of the federal limit found in 26 U.S.C. 401(a)(17). In addition, regular compensation for members who retire after April 2, 2012 will be limited to prohibit "spiking" of a member's salary to increase the retirement benefit.

For all employees, the maximum annual amount of the retirement allowance is 80 percent of the member's final average salary. Any member who is a veteran also receives an additional yearly retirement allowance of $15 per year of creditable service, not exceeding $300. The veteran allowance is paid in addition to the 80 percent maximum.

Employee contributions

Date of Hire	Contribution Rate
Prior to January 1, 1975	5%
January 1, 1975 – December 31, 1983	7%
January 1, 1984 – June 30, 1996	8%
July 1, 1996 onward	9%

In addition, employees hired after December 31, 1978 contribute an additional 2 percent of salary in excess of $30,000.

Employees hired after 1983 who voluntarily withdraw their contributions with less than 10 ten years of credited service receive 3% interest on their contributions.

Employees in Group 1 hired on or after April 2, 2012 with 30 years of creditable service or greater will pay a base contribution rate of 6%.

Retirement benefits (superannuation)

Members of Group 1, 2 or 4 hired prior to April 2, 2012 may retire upon the attainment of age 55. For retirement at ages below 55, twenty years of creditable service is required.

Members hired prior to April 2, 2012 who terminate before age 55 with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System).

Members of Group 1 hired April 2, 2012 or later may retire upon the attainment of age 60. Members of Group 2 or 4 hired April 2, 2012 or later may retire upon the attainment of age 55. Members of Group 4 may retire upon attainment of age 50 with ten years of creditable service.

Members hired April 2, 2012 or later who terminate before age 55 (60 for members of Group 1) with ten or more years of creditable service are eligible for a retirement allowance upon the attainment of age 55 (60 for members of Group 1) provided they have not withdrawn their accumulated deductions from the Annuity Savings Fund of the System.

Ordinary disability benefit

A member who is unable to perform his or her job due to a non-occupational disability will receive a retirement allowance if he or she has ten or more years of creditable service and has not reached age 55. The annual amount of such allowance shall be determined as if the member retired for superannuation at age 55 (age 60 for Group 1 members hired on or after April 2, 2012), based on the amount of creditable service at the date of disability. For veterans, there is a minimum benefit of 50 percent of the member's most recent year's pay plus an annuity based on his or her own contributions.

Accidental disability benefit

For a job-connected disability, the benefit is 72 percent of the member's most recent annual pay plus an annuity based on his or her own contributions, plus additional amounts for surviving children. Benefits are capped at 75 percent of annual rate of regular compensation for employees who become members after January 1, 1988

Death benefits

In general, the beneficiary of an employee who dies in active service will receive a refund of the employee's own contributions. Alternatively, if the employee were eligible to retire on the date of death, a spouse's benefit will be paid equal to the amount the employee would have received under Option C. The surviving spouse of a member who dies with two or more years of credited service has the option of a refund of the employee's contributions or a monthly benefit regardless of eligibility to retire, if they were married for at least one year. There is also a minimum widow's pension of $250 per month, and there are additional amounts for surviving children.

If an employee's death is job-connected, the spouse will receive 72 percent of the member's most recent annual pay, in addition to a refund of the member's accumulated deductions, plus additional amounts for surviving children. However, in accordance with Section 100 of Chapter 32, the surviving spouse of a police officer, firefighter or corrections officer is killed in the line of duty will be eligible to receive an annual benefit equal to the maximum salary held by the member at the time of death.

Upon the death of a job-connected disability retiree who retired prior to November 7, 1996, and could not elect an Option C benefit, a surviving spouse will receive an allowance of $9,000 per year if the member dies for a reason unrelated to cause of disability“

"Heart And Lung Law” and cancer presumption

Any case of hypertension or heart disease resulting in total or partial disability or death to a uniformed fireman, permanent member of a police department, or certain employees of a county correctional facility is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. Any case of disease of the lungs or respiratory tract resulting in total disability or death to a uniformed fireman is presumed to have been suffered in the line of duty, unless the contrary is shown by competent evidence. There is an additional presumption for uniformed firemen that certain types of cancer are job-related if onset occurs while actively employed or within five years of retirement.

Optional forms of benefits

Members may elect to receive a full retirement allowance payable for life under Option A. Under Option B a member may elect to receive a lower monthly allowance in exchange for a guarantee that at the time of death any contributions not expended for annuity payments will be refunded to the beneficiary. Option C allows the member to take a lesser retirement allowance in exchange for providing a survivor with two-thirds of the lesser amount. Option C pensioners will have benefits converted from a reduced to a full retirement if the beneficiary predeceases the retiree.

Post-retirement benefits

The Board has adopted the provisions of Section 51 of Chapter 127 of the Acts of 1999, which provide that the Retirement Board may approve an annual COLA in excess of the Consumer Price Index but not to exceed a 3% COLA on the first $15,000 of a retirement allowance. Cost-of-living increases granted prior to July 1, 1998, are reimbursed by the Commonwealth and not reflected in this report.

Changes in plan provisions

There have been no changes in plan provisions since the last valuation.

Appendix A: Definition of Pension Terms

The following list defines certain technical terms for the convenience of the reader:

Term	Definition
Actuarial accrued liability for actives	The equivalent of the accumulated normal costs allocated to the years before the valuation date.
Actuarial accrued liability for retirees and beneficiaries	Actuarial Present Value of lifetime benefits to existing retirees and beneficiaries. This sum takes account of life expectancies appropriate to the ages of the annuitants and the interest that the sum is expected to earn before it is entirely paid out in benefits.
Actuarial cost method	A procedure allocating the Actuarial Present Value of Future Benefits to various time periods; a method used to determine the Normal Cost and the Actuarial Accrued Liability that are used to determine the actuarially determined contribution.
Actuarial gain or loss	A measure of the difference between actual experience and that expected based upon a set of Actuarial Assumptions, during the period between two Actuarial Valuation dates. To the extent that actual experience differs from that assumed, Actuarial Accrued Liabilities emerge which may be the same as forecasted or may be larger or smaller than projected. Actuarial gains are due to favorable experience, e.g., assets earn more than projected, salary increases are less than assumed, members retire later than assumed, etc. Favorable experience means actual results produce actuarial liabilities not as large as projected by the actuarial assumptions. On the other hand, actuarial losses are the result of unfavorable experience, i.e., actual results yield actuarial liabilities that are larger than projected.
Actuarially equivalent	Of equal Actuarial Present Value, determined as of a given date and based on a given set of Actuarial Assumptions.
Actuarial present value	The value of an amount or series of amounts payable or receivable at various times, determined as of a given date by the application of a particular set of Actuarial Assumptions. Each such amount or series of amounts is: Adjusted for the probable financial effect of certain intervening events (such as changes in compensation levels, marital status, etc.) Multiplied by the probability of the occurrence of an event (such as survival, death, disability, withdrawal, etc.) on which the payment is conditioned, and Discounted according to an assumed rate (or rates) of return to reflect the time value of money.

Appendix A: Definition of Pension Terms

Term	Definition
Actuarial present value of future benefits	The Actuarial Present Value of benefit amounts expected to be paid at various future times under a particular set of Actuarial Assumptions, taking into account such items as the effect of advancement in age, anticipated future compensation, and future service credits. The Actuarial Present Value of Future Benefits includes the liabilities for active members, retired members, beneficiaries receiving benefits, and inactive members entitled to either a refund of member contributions or a future retirement benefit. Expressed another way, it is the value that would have to be invested on the valuation date so that the amount invested plus investment earnings would provide sufficient assets to pay all projected benefits and expenses when due.
Actuarial valuation	The determination, as of a valuation date, of the Normal Cost, Actuarial Accrued Liability, Actuarial Value of Assets, and related Actuarial Present Values for a plan, as well as Actuarially Determined Contributions.
Actuarial value of assets	The value of the plan's assets as of a given date, used by the actuary for valuation purposes. This may be the market or fair value of plan assets, but commonly plans use a smoothed value in order to reduce the year-to-year volatility of calculated results, such as the funded ratio and the Actuarially Determined Contribution.
Actuarially determined	Values that have been determined utilizing the principles of actuarial science. An actuarially determined value is derived by application of the appropriate actuarial assumptions to specified values determined by provisions of the plan.
Actuarially determined contribution	The employer's contributions, expressed as a dollar amount or a percentage of covered plan compensation, determined under the plan's funding policy. The ADC consists of the Employer Normal Cost and the Amortization Payment.
Amortization method	A method for determining the Amortization Payment. The most common methods used are level dollar and level percentage of payroll. Under the Level Dollar method, the Amortization Payment is one of a stream of payments, all equal, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the Amortization Payment is one of a stream of increasing payments, whose Actuarial Present Value is equal to the Unfunded Actuarial Accrued Liability. Under the Level Percentage of Pay method, the stream of payments increases at the assumed rate at which total covered payroll of all active members will increase.
Amortization payment	The portion of the pension plan contribution, or ADC, that is intended to pay off the Unfunded Actuarial Accrued Liability.
Assumptions or actuarial assumptions	The estimates upon which the cost of the plan is calculated, including: **Investment return** — the rate of investment yield that the plan will earn over the long-term future; **Mortality rates** — the rate or probability of death at a given age for employees and retirees; **Retirement rates** — the rate or probability of retirement at a given age or service; **Disability rates** — the rate or probability of disability retirement at a given age; **Withdrawal rates** — the rate or probability at which employees of various ages are expected to leave employment for reasons other than death, disability, or retirement; **Salary increase rates** — the rates of salary increase due to inflation, real wage growth and merit and promotion increases.

Appendix A: Definition of Pension Terms

Term	Definition
Closed amortization period	A specific number of years that is counted down by one each year, and therefore declines to zero with the passage of time. For example, if the amortization period is initially set at 20 years, it is 19 years at the end of one year, 18 years at the end of two years, etc. See Open Amortization Period.
Decrements	Those causes/events due to which a member's status (active-inactive-retiree-beneficiary) changes, that is: death, retirement, disability, or withdrawal.
Defined benefit plan	A retirement plan in which benefits are defined by a formula based on the member's compensation, age and/or years of service.
Defined contribution plan	A retirement plan, such as a 401(k) plan, a 403(b) plan, or a 457 plan, in which the contributions to the plan are assigned to an account for each member, the plan's earnings are allocated to each account, and each member's benefits are a direct function of the account balance.
Employer normal cost	The portion of the Normal Cost to be paid by the employer. This is equal to the Normal Cost less expected member contributions.
Experience study	A periodic review and analysis of the actual experience of the plan that may lead to a revision of one or more actuarial assumptions. Actual rates of decrement and salary increases are compared to the actuarially assumed values and modified based on recommendations from the Actuary.
Funded ratio	The ratio of the Actuarial Value of Assets (AVA) to the Actuarial Accrued Liability (AAL). Plans sometimes also calculate a market funded ratio, using the Market Value of Assets (MVA), rather than the AVA.
GASB 67 and GASB 68	Governmental Accounting Standards Board (GASB) Statements No. 67 and No. 68. These are the governmental accounting standards that set the accounting rules for public retirement systems and the employers that sponsor or contribute to them. Statement No. 68 sets the accounting rules for the employers that sponsor or contribute to public retirement systems, while Statement No. 67 sets the rules for the systems themselves.
Investment return	The rate of earnings of the plan from its investments, including interest, dividends and capital gain and loss adjustments, computed as a percentage of the average value of the fund. For actuarial purposes, the investment return often reflects a smoothing of the capital gains and losses to avoid significant swings in the value of assets from one year to the next.
Net Pension Liability (NPL)	The Net Pension Liability is equal to the Total Pension Liability minus the Plan Fiduciary Net Position.
Normal cost	The portion of the Actuarial Present Value of Future Benefits and expenses, if applicable, allocated to a valuation year by the Actuarial Cost Method. Any payment with respect to an Unfunded Actuarial Accrued Liability is not part of the Normal Cost (see Amortization Payment). For pension plan benefits that are provided in part by employee contributions, Normal Cost refers to the total of member contributions and employer Normal Cost unless otherwise specifically stated.
Open amortization period	An open amortization period is one which is used to determine the Amortization Payment but which does not change over time. If the initial period is set as 30 years, the same 30-year period is used in each future year in determining the Amortization Period.

Appendix A: Definition of Pension Terms

Term	Definition
Plan Fiduciary Net Position	Market value of assets.
Service costs	The portions of the actuarial present value of projected benefit payments that are attributed to valuation years.
Total Pension Liability (TPL)	The actuarial accrued liability under the entry age normal cost method and based on the blended discount rate as described in GASB 67 and 68.
Unfunded actuarial accrued liability	The excess of the Actuarial Accrued Liability over the Actuarial Value of Assets. This value may be negative, in which case it may be expressed as a negative Unfunded Actuarial Accrued Liability, also called the Funding Surplus or an Overfunded Actuarial Accrued Liability.
Valuation date or actuarial valuation date	The date as of which the value of assets is determined and as of which the Actuarial Present Value of Future Benefits is determined. The expected benefits to be paid in the future are discounted to this date.