STATE
RETIREMENT SYSTEM

ACTUARIAL VALUATION REPORT

JANUARY 1, 2025

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1. INTRODUCTION & CERTIFICATION

This report presents the results of the actuarial valuation of the State Retirement System. The valuation was performed as of January 1, 2025, pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts and based on the plan provisions at that time. The actuarial assumptions used to calculate the accrued liability and the normal cost primarily reflect our most recent Experience Study Analysis report which we issued in 2014 and subsequent retiree mortality analysis in 2015 and 2017. The actuarial assumptions used in this valuation are the same as those used in the January 1, 2024 actuarial valuation.

This valuation was based on member data as of December 31, 2024, which was supplied by the State Retirement Board. Such tests as we deemed necessary were performed on the data to ensure accuracy. Asset information as of December 31, 2024 was provided by the Pension Reserves Investment Management Board. Both the membership data and financial information were reviewed for reasonableness but not audited by us.

This report was prepared by PERAC for the exclusive use of the State Retirement Board, its staff and its auditors. The report was performed to determine the funded status of the System and the contribution requirements to ensure that System assets along with the contributions are sufficient to provide the prescribed benefits. Use of this report by other parties may not be appropriate and may result in mistaken conclusions because of the failure to understand applicable assumptions, methods or the inapplicability of the report for purposes other than those intended. PERAC should be asked to review any statement to be made based on the results presented in this report. PERAC will accept no responsibility for any such statement made without its prior review.

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 natural operation of the methodology used for these measurements such as additional contribution requirements based on the plan's funded status; and changes in plan provisions or applicable law. As part of this valuation, we have not performed an analysis of the potential range of future measurements.

We, the undersigned actuaries, meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained in this report. In our opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent our best estimate of anticipated experience. We believe this report represents an accurate appraisal of the actuarial status of the State Retirement System performed in accordance with generally accepted actuarial principles and practices relating to pension plans.

Respectfully submitted,
Public Employee Retirement Administration Commission

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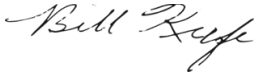

William T. Keefe
Executive Director

October 8, 2025

2. EXECUTIVE SUMMARY

A | PRINCIPAL VALUATION RESULTS

The provisions of Chapter 32, Section 22C mandate the establishment of a funding schedule for the Commonwealth of Massachusetts' pension obligation. The State Retirement System (SRS) reflects one component of the Commonwealth schedule. The other components are the Massachusetts Teachers' Retirement System, liabilities for Boston teachers, and State reimbursements to local systems to reflect COLAs granted from 1982 through 1996 (determined on an actuarial basis). Beginning in FY18, Chapter 5 of the Acts of 2017 required that several additional items be included in the development of the Commonwealth funding schedule but shown separately. These items include the administrative expenses of the Public Employee Retirement Administration Commission (PERAC), the employer contribution to the Optional Retirement Plan (ORP) under Section 40 of Chapter 15A, and a modification to the COLA reimbursement to local systems described above to reflect actual reimbursements. Beginning in FY24, Chapter 126 of the Acts of 2022 required the inclusion of the administrative expenses for the Department of Higher Education's deferred compensation plan (403(b) plan). The schedule, as mandated by law, calls for payment of the Normal Cost plus an amortization payment on the Unfunded Actuarial Liability (UAL).

The Commonwealth's current funding schedule was filed in January 2023 and was based on the results of the January 1, 2022 Commonwealth Actuarial Valuation. The FY26 appropriation under the schedule is $4.933 billion. The total appropriation under the schedule increases 9.63% each year until FY28. Beginning in FY29, the remaining UAL is amortized on a 4.0% annual increasing basis to FY36. The amortization of the 2015 Early Retirement Incentive (ERI) is scheduled to be completed in FY27. As part of Chapter 77 of the Acts of 2023, there was a transfer of $100 million to the Commonwealth Pension Liability Fund. It was our understanding that this amount was to retire the liability associated with the 2015 ERI. The next schedule will be adopted in early 2026 based on the results of the 2025 Commonwealth actuarial valuation. As a result of the additional payment, the next schedule will not include a separate amortization for the 2015 ERI.

The SRS's share of the FY26 Commonwealth appropriation is $1.768 billion. The 2015 ERI amortization payment is $28.4 million and is included in this figure.

The principal results of the January 1, 2025 actuarial valuation are as follows (in thousands):

Total Normal Cost	$1,241,798
Expected Employee Contributions	$776,084
Net Employer Normal Cost	$465,714
Total Expenses and Transfers	$99,435
Net Normal Cost Plus Expenses and Transfers	$565,149
Total Actuarial Accrued Liability	$52,798,510
Actuarial Value of Assets	$39,007,768
Unfunded Actuarial Liability	$13,790,742
Funded Ratio	73.9%

2. EXECUTIVE SUMMARY

B | COMPARISON WITH PRIOR VALUATION AND EXPERIENCE ANALYSIS

A comparison of the current valuation and the January 1, 2024 valuation is shown below (dollars in thousands except salary and benefit figures).

	1/1/25	1/1/24	Increase/ (Decrease)	% Increase/ (Decrease)
Total Normal Cost	$1,241,798	$1,183,171	$58,627	5.0%
Expected Employee Contributions	$776,084	719,934	$56,150	7.8%
Net Normal Cost	$465,714	$463,237	$2,477	0.5%
Expenses	$64,150	$52,560	$11,590	22.1%
Optional Retirement Plan Payment	15,100	22,500	($7,400)	(32.9%)
Deferred Comp (403(b)) Plan Payment	585	627	($ 42)	(6.7%)
3(8)(c) Amounts Transferred to Other Systems	19,600	19,700	($ 100)	(0.5%)
Total Expenses and Transfers	$99,435	$95,387	$4,048	4.2%
Net Normal Cost plus Expenses and Transfers	$565,149	$558,624	$6,525	1.2%
Total Actuarial Liability	$52,798,510	$51,151,483	$1,647,027	3.2%
Assets	$39,007,768	37,065,525	$1,942,243	5.2%
Unfunded Actuarial Liability	$13,790,742	$14,085,958	($295,216)	(2.1%)
Funded Ratio	73.9%	72.5%	1.4%	

Number of Active Employees	93,138	90,988	2,150	2.4%
Total Salary	$8,247,464,078	$7,688,333,482	$559,130,596	7.3%
Average Salary	$88,551	$84,498	$4,053	4.8%
Average Age	46.5	46.6	(0.1)	(0.2%)
Average Service	11.3	11.4	(0.1)	(0.9%)
Number of Retirees/Survivors	70,243	69,750	493	0.7%
Total Benefits	$3,026,268,183	$2,934,908,444	$91,359,739	3.1%
Average Benefits	$43,083	$42,078	$1,005	2.4%
Average Age	73.0	72.7	0.3	0.4%

Total Expenses and Transfers

In our 2017 valuation, we began showing the expense and transfer items separately from the normal cost. Expenses reflect the administrative expenses from the most recent Annual Statement and include a portion of investment-related expenses, PERAC's administrative expenses, the Optional Retirement Plan (ORP) payment and expenses for administering the deferred compensation plan. The ORP payment is the amount transferred by statute from the Commonwealth (previously from SRS) to the ORP for higher education employees. By including this payment as part of the normal cost, we have treated it as a reimbursement to the pension trust fund. Finally, $19.6 million is included for amounts transferred to other systems under Section 3(8)(c) for members with State service who retired from another system. Section 3(8)(c) receipts from other systems are transferred to the State's general account. By including the Section 3(8)(c) disbursements in normal cost, the net Section 3(8)(c) cash flow is zero for funding purposes.

2. EXECUTIVE SUMMARY *(continued)*

B | COMPARISON WITH PRIOR VALUATION AND EXPERIENCE ANALYSIS *(continued)*

Gain/Loss

The development of the actuarial gain/(loss) is shown on page 11. During 2024, there was an overall actuarial gain of $402 million. There was a non-investment-related gain (gain on actuarial accrued liability) of $146 million. This gain is quite small and reflects that the assumptions are reasonable. There was a gain of $256 million on the actuarial value of assets (AVA). The return on assets for 2024 was approximately 7.7% on an AVA basis, compared to 9.64% on a market value basis.

There were 83,459 active members as of January 1, 2024 who remained in active status as of January 1, 2025. Pay for these members increased approximately 7.1% over the one year which is greater than assumed and generated a loss. There was a net gain from all other sources, including data corrections, that more than offset the salary loss and resulted in a small overall gain.

We value system assets using a smoothing technique which spreads gains and losses over short periods (5 years) and employs a "corridor" so that the actuarial value is within 10% of the market value of assets (MVA). The calculated AVA as of January 1, 2025 is 100.5% of the market value.

The UAL decreased from $14.09 billion as of January 1, 2024 to $13.79 billion as of January 1, 2025.

Actuarial Assumptions

Investment Return

The January 1, 2025 valuation reflects a 7.0% investment return assumption (the same as the January 1, 2024 assumption). The investment return assumption decreased several times from 2012-2021. The Commission has maintained this assumption since 2021.

Early this year, NEPC, The Pension Reserves Investment Trust's investment consultant, provided figures for 10-year (short-term) and 30-year (long-term) expected return projections using a building block approach, the target allocation and expected long-term returns by asset class. The expected long-term (30-year) annual return in this study is 8.0%. This figure is 30 basis points (bps) greater than the corresponding figure from the 2024 study. The 8.0% average expected long-term return does not mean that the expected return each year will be 8.0%. In fact, over the shorter term (10 years), the average expected return is 6.9% (30 bps greater than last year). Greater expected returns in later years determined NEPC's long-term projection. The NEPC projected returns are one measure we review to determine the Commonwealth's recommended investment return assumption.

A comparison of recent expected return projections as well as historical PRIT returns is shown below.

	Expected Annual Return						
	2019	2020	2021	2022	2023	2024	2025
10-year expected return *	6.8%	6.2%	5.8%	5.7%	7.0%	6.6%	6.9%
30-year expected return	7.9%	7.3%	6.8%	6.9%	7.7%	7.7%	8.0%

* In years prior to 2020, NEPC's short-term horizon was 5-7 years

Actual Returns as of December 31, 2024	
2024	9.6%
5 years (2020-2024)	8.1%
10 years (2015-2024)	8.1%
20 years (2005-2024)	7.6%
40 years (1985-2024)	9.4%

Note: Historically, PRIT reported its returns gross of expenses. Beginning with the 2024 return, PRIM reported the annual return net of expenses. PERAC calculated the gross return to be 9.62% for 2024 compared to the PRIM reported return of 9.07%.

Besides the NEPC analysis, we review the capital market assumptions (CMAs) of other investment consultants for comparison. We estimate the short-term and long-term expected returns using these capital market assumptions and PRIT's asset allocation. The expected returns using these CMAs are generally consistent with that of NEPC.

In addition, we also review the Horizon Actuarial Services Survey of Capital Market Assumptions. The latest survey compares the assumptions of 41 different investment consultants, including NEPC. The Horizon study used in our analysis was published in August 2024. Since it reflects 2024 capital market assumptions, there is a one-year lag between the current results of the Horizon survey and the current NEPC study. The Horizon long-term (20 years) expected return based on its hypothetical portfolio is 7.0% (7.2% in the prior study) and is fairly consistent with the level expectation we saw with NEPC a year ago. We also estimated the short-term and long-term results using the Horizon average expected returns by asset class and PRIT's asset allocation. This result is consistent with NEPC. The results of the Horizon survey appear to show a bottoming of the long-term expected returns two years ago.

The National Association of State Retirement Administrators (NASRA) periodically publishes a survey of investment return assumptions used by over 100 large public plans. The most recent survey available at the time of our analysis was published in July 2024. In this survey, the average investment return assumption was 6.90%, a slight decrease from the 6.91% figure published in July 2023. Although the NASRA survey does not consider different asset allocations between the plans, it has demonstrated a continuing reduction since 2012, and perhaps a bottoming of this assumption.

We will continue to monitor this assumption in each future valuation.

Mortality

Based on our analysis of State retiree mortality during 2012, 2013, and 2014, we adopted a fully generational assumption in the 2015 actuarial valuation. In early 2017, we analyzed retiree mortality experience during 2015 and 2016. We adopted a blue-collar version of the RP-2014 table for superannuation retirees as it best matched our experience. We maintained the base mortality table but we updated to the MP-2021 mortality improvement scale (from MP-2020) in the January 1, 2023 actuarial valuation. We maintained the base table and the mortality improvement scale in this valuation.

Job Groups

We noted several issues relating to job group as part of the valuation data we received from SRS and made similar adjustments as we have in the past. As we have done in previous years, we changed the job group for several University of Massachusetts Police members from Group 1 to Group 2.

In the 2017 valuation, we analyzed costs for certain members of the Department of Mental Health (DMH) and Social Services who were coded as job Group 1. We determined plan liabilities for these members based on both Group 1 and Group 2 status. DMH members with certain titles and Social Services workers with 10 years of service in certain capacities are eligible to be in Group 2. Based on our discussions with SRS, most of these members will ultimately be eligible for Group 2 status. By assuming these members will ultimately be in Group 2, we are being somewhat conservative. We used the results of our 2017 work to estimate the increase in actuarial liability due to this adjustment to be approximately $160 million in this valuation.

Chapter 176 Provisions

Chapter 176 of the Acts of 2011, *An Act Providing for Pension Reform and Benefit Modernization,* made many changes to the Chapter 32 pension law. There are several changes that will have the most impact on decreasing plan liabilities over the longer term. These include an increase in the normal retirement age by two years (for example, from age 65 to age 67 for Group 1 members), an increase in the age (early retirement) reduction factor for ages below the maximum age (from a 4.0% to a 6.0% annual reduction), and an increase in the period for determining a member's average annual compensation (from 3 years to 5 years). These changes are effective only for members hired after April 1, 2012.

As of January 1, 2025, there were approximately 59,400 members hired after April 1, 2012. The normal cost is approximately $95 million lower and the actuarial liability is approximately $825 million lower for these members under the new provisions compared to the figures under the prior provisions.

COVID-19 Pandemic

The assumptions in this report do not reflect any potential impacts of the COVID-19 pandemic on the System. In the short-term, the pandemic likely had a material effect on the mortality experience, and to a lesser extent, the retirement and withdrawal experience in ways not anticipated by the assumptions on which the projections are based.

2. EXECUTIVE SUMMARY *(continued)*

C | FUNDING PROGRESS

The UAL and funded ratio are measures of the plan's funded status. These measures reflect the plan's position as of January 1, 2025. We believe these measures alone are not appropriate for assessing the sufficiency of assets to cover the estimated cost of settling the State Retirement System's benefit obligations or assessing the need for or the amount of future contributions. However, we believe these measures, in conjunction with maintaining the appropriations required under the Commonwealth funding schedule, are appropriate for assessing the amount of future contributions.

The nature of actuarial funding is that assets gradually catch up to the actuarial liability. When pension funding was adopted in 1987, the initial amortization period was established as 40 years. Based on the amortization basis of the schedules adopted, the UAL was expected to increase for a period of time. However, due to actual investment returns significantly exceeding the expected return in the 1990s, the UAL actually decreased until January 1, 2000.

It is important to note that plan assets have grown faster than plan liabilities. As of January 1, 1990, the actuarial liability was $7.5 billion and assets were $3.7 billion. As of January 1, 2025, the actuarial liability is $52.8 billion and the actuarial value of assets is $39.0 billion. The actuarial liability has grown 7 times over this period ($52.8B / $7.5B). But assets have grown 10.5 times over this same period ($39.0B / $3.7B). For this reason, we believe the funded ratio represents a better measure of the Commonwealth's funding progress.

3. SUMMARY OF VALUATION RESULTS

(Dollars in thousands)

A. Number of Members on Current Valuation Date	
Active Members	93,138
Vested Terminated Members	5,516
Non-Vested Terminated Members	32,892
Retired Members and Survivors	70,243
Total	201,789
B. Total Regular Compensation of Active Members	$8,247,464
C. Present Value of Future Benefits	
Active Members	$31,908,187
Retirees, Survivors, and Inactive Members	31,150,933
Total Present Value of Future Benefits	$63,059,120
D. Normal Cost	
Total Normal Cost	$1,241,798
Expected Employee Contributions	776,084
Net Employer Normal Cost	$465,714
Total Expenses and Transfers	99,435
Net Normal Cost plus Expenses and Transfers	$565,149
E. Actuarial Liability	
Active Members	$21,647,577
Vested Terminated Members	1,359,214
Non-Vested Terminated Members	380,801
Retirees and Survivors	29,410,918
Total Actuarial Liability	$52,798,510
F. Actuarial Value of Assets	$39,007,768
G. Unfunded Actuarial Liability: E – F	$13,790,742
H. Funded Ratio: F/E	73.9%

4. PLAN ASSETS

A | SUMMARY OF ASSETS (dollars in thousands unless otherwise specified)

Pension Reserves Investment Trust (State Retirement System)	
Market value of assets	$38,827,939
Actuarial value of assets	$39,007,768

The actuarial value of assets (AVA) is determined so that 20% of the investment gain or loss in a given year is recognized annually for the ensuing five years. Therefore, these investment gains and losses are fully recognized after five years. In addition to this treatment of gains and losses, we use a "corridor" approach so that the AVA can never be too far from the market value of assets. Under our approach for the Commonwealth, the AVA cannot be less than 90% nor greater than 110% of the market value. As of January 1, 2025, the calculated AVA is 100.5% of the MVA.

4. PLAN ASSETS *(continued)*

B | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS (In thousands)

	2024	2025
A. Market Value Tracking		
1. Beginning of year Market Value of Assets	36,244,038	38,827,939
2. Cash Flow		
a. Net receipts *	934,907	
b. Net disbursements *	1,812,234	
c. Cash flow: (a) – (b)	(877,327)	
3. End of year Market Value of Assets	38,827,939	
4. Investment income including appreciation: (3) – (1) – (2(c))	3,461,228	
B. Expected market value development		
1. Beginning of year Market Value of Assets	36,244,038	
2. Cash flow (A2(i))	(877,327)	
3. Expected Return on (1)	2,537,083	
4. Expected return on cash flow A2(i) x 0.07 / 2	(30,706)	
5. Expected Market Value of Assets end of year (1)+(2)+(3)+(4)	37,873,088	
C. Gain/(loss) for year: A3-B5	954,851	
D. Development of Actuarial Value of Assets		
1. Beginning of year Market Value of Assets	36,244,038	38,827,939
2a. Asset gain/(loss) in prior year	1,530,992	954,851
b. Asset gain/(loss) in 2nd prior year	(6,826,854)	1,530,992
c. Asset gain/(loss) in 3rd prior year	4,342,176	(6,826,854)
d. Asset gain/(loss) in 4th prior year	1,564,805	4,342,176
3. Unrecognized gain/(loss) .8 x [2a] + .6 x [2b] + .4 x [2c] +.2 x [2d]	(821,487)	(179,830)
4. Beginning of year Actuarial Value of Assets: [1] - [3]	37,065,525	39,007,768
5. Actuarial Value of Assets / Market Value of Assets	102.3%	100.5%
6. Adjusted Actuarial Value of Assets: (4) but not less than 90% nor greater than 110% of market value	37,065,525	39,007,768

* Reflects actual cash flow of PRIT fund

5. DEVELOPMENT OF THE ACTUARIAL GAIN OR LOSS (In millions)

A | GAIN/(LOSS) ON ACTUARIAL LIABILITY

1. Actuarial Liability 1/1/24	51,152
2. Total Normal Cost 1/1/24	1,183
3. Interest on (1) and (2)	3,663
4. Benefits paid during 2024 [a]	2,950
5. Interest on (4) assuming mid-year payment	103
6. Expected Actuarial Liability 1/1/25: (1)+(2)+(3)-(4)-(5)	52,945
7. Actuarial Liability 1/1/25	52,799
8. Total Gain/(Loss): (6)-(7)	146

B | GAIN/(LOSS) ON PLAN ASSETS

1. Actuarial Value of Assets (AVA) 1/1/24	37,065
2. Interest on (1)	2,595
3. Net Receipts 2024 [b]	935
4. Net Disbursements 2024 [b]	1,812
5. Net Cash Flow 2024: (3)-(4)	(877)
6. Interest on (5) assuming mid-year payment	(31)
7. Expected AVA 1/1/25: (1)+(2)+(5)+(6)	38,752
8. AVA 1/1/25	39,008
9. Total Gain/(Loss) on Assets: (8)-(7)	256

C | TOTAL GAIN/(LOSS)

1. Actuarial liability Gain/(Loss) (A8)	146
2. Asset Gain/(Loss) (B9)	256
3. Total Gain/(Loss): (1)+(2)	402

[a] Estimated
[b] From Annual Statement

6. INFORMATION ON SYSTEM MEMBERSHIP

A critical element of an actuarial valuation is accurate and up-to-date membership information. PERAC conducted an extensive review of member data submitted for this valuation.

A | ACTIVE MEMBERS

	Actives
Number of Members	93,138
Average Age	46.5
Average Service	11.3
Average Salary	$88,551
Average Annuity Savings Fund Balance	$75,432

Age by Service Distribution of Active Members

	Years of Service							
Present Age	0 - 4	5 –9	10 - 14	15 - 19	20 - 24	25 - 29	30+	Total
0 - 24	2,876	7						2,883
25 - 29	6,709	859	3					7,571
30 - 34	5,988	3,307	704	2				10,001
35 - 39	4,772	3,350	2,745	626	11			11,504
40 - 44	3,637	2,557	2,378	2,335	517	8		11,432
45 - 49	3,017	1,999	1,751	1,893	1,562	503	2	10,727
50 - 54	2,555	1,719	1,567	1,768	1,624	1,784	558	11,575
55 - 59	2,247	1,588	1,476	1,569	1,504	1,638	1,848	11,870
60 - 64	1,322	1,275	1,235	1,380	1,171	1,156	1,842	9,381
65+	682	795	872	896	861	760	1,328	6,194
Total	33,805	17,456	12,731	10,469	7,250	5,849	5,578	93,138

6. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

A | ACTIVE MEMBERS *(continued)*

Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	2,883	$156,729,493	$54,363
25 - 29	7,571	$505,374,244	$66,751
30 - 34	10,001	$759,897,072	$75,982
35 - 39	11,504	$969,730,878	$84,295
40 - 44	11,432	$1,033,476,718	$90,402
45 - 49	10,727	$1,008,173,826	$93,985
50 - 54	11,575	$1,115,612,800	$96,381
55 - 59	11,870	$1,159,515,568	$97,685
60 - 64	9,381	$923,765,322	$98,472
65+	6,194	$615,188,157	$99,320
Total	93,138	$8,247,464,078	$88,551

6. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

B | RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	59,579	526	3,432	6,706	70,243
Average Age	73.3	65.5	66.4	74.9	73.0
Average Annual Benefit	$44,890	$23,948	$49,347	$25,322	$43,083

Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Total Annuity	$575,529,831	$2,255,979	$15,658,127	$30,325,802	$623,769,739
Pension (excluding State reimbursed COLA)	$2,098,972,332	$10,340,484	$153,700,360	$139,485,268	$2,402,498,444
Total	$2,674,502,163	$12,596,463	$169,358,487	$169,811,070	$3,026,268,183

6. INFORMATION ON SYSTEM MEMBERSHIP *(continued)*

B | RETIREES & SURVIVORS *(continued)*

Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	212	$6,935,218	$32,713
40 - 44	161	$7,016,650	$43,582
45 - 49	362	$15,328,770	$42,345
50 - 54	1,042	$50,400,692	$48,369
55 - 59	3,462	$169,474,367	$48,953
60 - 64	7,685	$359,929,001	$46,835
65 - 69	13,286	$609,167,840	$45,850
70 - 74	15,090	$676,911,377	$44,858
75 - 79	13,394	$566,438,795	$42,290
80 - 84	8,233	$321,143,823	$39,007
85 - 89	4,467	$157,637,371	$35,289
90+	2,849	$85,884,279	$30,145
Totals	70,243	$3,026,268,183	$43,083

7. VALUATION COST METHODS

A | ACTUARIAL COST METHOD

The Actuarial Cost Method which was used to determine pension liabilities in this valuation is known as the *Entry Age Normal Cost Method***.** Under this method the *Normal Cost* for each active member on the valuation date is determined as the level percent of salary, which, if paid annually from the date the employee first became a member of the retirement system, would fully fund by retirement, death, disability or termination, the projected benefits which the member is expected to receive. The *Actuarial Liability* for each member is determined as the present value as of the valuation date of all projected benefits which the member is expected to receive, minus the present value of future annual Normal Cost payments expected to be made to the fund. Since only active members have a Normal Cost, the Actuarial Liability for inactive members, retirees and survivors is simply equal to the present value of all projected benefits. The sum of Normal Cost and Actuarial Liability for each member is equal to the Normal Cost and Actuarial Liability for the Plan. The *Unfunded Actuarial Liability* is the Actuarial Liability less current assets.

The Normal Cost for a member will remain a level percent of salary for each year of membership except for changes in provisions of the Plan or the actuarial assumptions employed in projection of benefits and present value determinations. The Normal Cost for the entire system will also change due to the addition of new members or the retirement, death or termination of members. The Actuarial Liability for a member will increase each year to reflect the additional accrual of Normal Cost. It will also change if the Plan provisions or actuarial assumptions are changed.

Differences each year between the actual experience of the Plan and the experience projected by the actuarial assumptions are reflected by adjustments to the Unfunded Actuarial Liability. An experience difference which increases the Unfunded Actuarial Liability is called an *Actuarial Loss* and one which decreases the Unfunded Actuarial Liability is called an *Actuarial Gain.*

B | ASSET VALUATION METHOD

The actuarial value of assets is determined in accordance with the deferred recognition method under which 20% of the gains or losses occurring in the prior year are recognized, 40% of those occurring 2 years ago are recognized, etc., so that 100% of gains or losses occurring 5 years ago are recognized. The actuarial value of assets will be adjusted, if necessary, in order to remain between 90% and 110% of market value.

C | LOW-DEFAULT-RISK OBLIGATION MEASURE (LDROM)

The Low-Default-Risk Obligation Measure (LDROM) was determined using the *Entry Age Normal Cost Method* (the same method used to determine the plan's actuarial liabilities). The LDROM was calculated using the same assumptions as used to determine the plan's actuarial liabilities except the LDROM was calculated using a 5.44% discount rate.

For more information on the LDROM, see our discussion in Section 8 of this report.

8. ACTUARIAL DISCLOSURES

A | RISK

Risk is defined as the potential for differences in future plan measurements resulting from actual future experience deviating from actual assumed experience. The plan is subject to a number of risks that could affect the plan's future financial condition. Examples of risk include the following:

Investment risk – the potential that investment returns will be different than expected;

Asset/liability mismatch risk – the potential that changes in asset values are not matched by changes in the liabilities;

Interest rate risk – the potential that interest rates will be different than expected;

Longevity and demographic risk – the potential that mortality or other demographic experience will be different than expected;

Contribution risk – the potential that employer contributions to the plan will not be made or will not be made at the assumed level.

In this section, we provide a brief analysis of several risk measures that we believe are most significant for the plan. A more detailed risk assessment that includes further scenario testing (assessing the impact of one or several events on the plan's financial condition, for example projecting plan investment returns), stress testing (assessing the impact of an adverse change in one or several factors), sensitivity testing (assessing the impact of a change in an actuarial assumption), or stochastic modeling (generating numerous possible outcomes by allowing for random variations in input items to assess the distribution of the outcomes) may provide a better understanding than the analysis in this section.

Unfunded Actuarial Liability and Funded Ratio

The plan's unfunded actuarial liability (UAL) and the funded ratio for the past 10 years are shown below. The UAL is the Actuarial Liability less the Actuarial Value of Assets. The funded ratio is the Actuarial Value of Assets divided by the Actuarial Liability. The retirement system is said to be fully funded when the UAL is zero, or said another way, when the funded ratio is 100%. Actuarial valuations have been performed every year over this period (except in 2020) and the valuation results are determined as of January 1.

	Valuation Date									
	2015	2016	2017	2018	2019	2021	2022	2023	2024	2025
UAL (in billions)	$11.0	$13.5	$13.5	$14.2	$15.5	$15.3	$12.8	$14.1	$14.1	$13.8
Funded Ratio	67.5%	63.5%	64.7%	64.9%	63.7%	66.5%	72.9%	71.3%	72.5%	73.9%

8. ACTUARIAL DISCLOSURES *(continued)*

A | RISK *(continued)*

Investment Return Assumption and Funding Schedule

Investment return assumption:	7.0%
Amortization of UAL basis:	9.63% total appropriation increase to FY28, then 4.0% increasing amortization of the remaining UAL to FY36

The investment return assumption of 7.0% is consistent with our 2025 recommended assumption. Currently, approximately 75% of Chapter 32 systems use an assumption of 7.0% or lower.

It is important to note that our emphasis since 2013 has been for systems to establish funding schedules that complete the amortization of the UAL no later than FY35. This allows systems some flexibility in the event of another market downturn. In 2011, the Commonwealth adopted a schedule that extended the amortization of the UAL to FY40 due to the 2008 investment loss. In 2014, the schedule reduced the amortization period to FY36. The 2017 and 2020 schedules maintained the FY36 date by increasing the level of future appropriations. The 2023 schedule maintained the 9.63% annual increase from the 2020 schedule until FY28 but reverts to a traditional increasing amortization schedule in FY29 and maintains the FY36 payoff date.

A related priority to fully funding the System by FY35 is limiting the amount and period of "negative amortization". Negative amortization occurs while the UAL increases in the funding schedule. The reason it occurs is that the amortization payment for a given year is not large enough to pay the interest on the UAL. Negative amortization often occurs in amortization schedules with annual increasing payments. Negative amortization is acceptable as long as it is only for a limited period of time. We believe the goal for all systems should be to eliminate negative amortization as soon as possible. The current schedule has no negative amortization.

Several Massachusetts systems have adopted schedules that increase the total appropriation by a set percentage for a period of time (or the entire length of the schedule). The Commonwealth schedule reflects this methodology. Since the level of annual increase exceeds 6.0% for the next few years, there is some risk in whether such a level of annual increase is sustainable. However, the Commonwealth has consistently met (and increased as necessary) the higher level of appropriations since the 2011 schedule was adopted.

8. ACTUARIAL DISCLOSURES *(continued)*

A | RISK *(continued)*

Maturity and Volatility Measures

There are several plan maturity and volatility ratios that can provide significant insight into the level of a plan's risk. To illustrate, we are providing two such measures. In both cases, we show the 10-year history of the ratio. In addition, we comment on how the results compare with other local systems. We believe that these measures are more useful when compared to historical averages and the results of other plans. See our notes earlier in this section regarding the assumption changes over this period which significantly affect these results.

Retiree Actuarial Liability / Total Actuarial Liability

This ratio measures the percentage of actuarial liability due to the plan's retirees. Higher ratios and/or an increase in this ratio indicate a system that is more mature or becoming more mature. As this ratio increases, it generally indicates the retired population is increasing faster than the active member population and there is a greater likelihood of negative cash flow (benefit payments exceeding employer and employee contributions). Retirees in pay status are more expensive than younger members. As a plan matures, it becomes more sensitive to investment volatility and the plan will have more difficulty recovering from losses even with increases in employer contributions.

Valuation Date									
2015	2016	2017	2018	2019	2021	2022	2023	2024	2025
0.50	0.53	0.54	0.54	0.55	0.56	0.57	0.57	0.56	0.56

The ratios for this system show a slow, steady increase until 2022 and consistent thereafter, indicating the plan has become more mature. Public sector plans often have aging populations generating an increase in this ratio. We have found this to be generally true for the systems for which PERAC is the actuary. In 2015, this ratio ranged from .35 to .63. In recent valuations this range has increased to .50 to .67. Many local systems have seen an increase in this ratio over the past 10-15 years as the number of retirees, and specifically the retiree liability has increased as a percentage of the total. A number of systems have had fairly consistent ratios and a few have had decreasing ratios. Such systems have already reached and or maintained a more mature level.

Actuarial Liability / Pay

This measure reflects how a change in actuarial liability (and therefore UAL) may impact the adequacy of contributions. As this ratio increases, plan contributions (using a traditional amortization schedule) increase as a percentage of pay. Furthermore, like the Retiree Liability ratio noted above, higher ratios exacerbate the impact of investment losses on plan contributions.

Valuation Date									
2015	2016	2017	2018	2019	2021	2022	2023	2024	2025
6.0	6.4	6.5	6.6	6.7	7.0	7.1	6.9	6.7	6.4

This system shows mostly increasing rates until 2022 with decreases thereafter. For comparison with other PERAC systems, in 2015, this ratio ranged from 4.5 to 8.0. For more recent valuations this range has increased. The ratios currently range from 4.9 to 8.5. This ratio has increased for most local systems indicating increasing levels of risk.

8. ACTUARIAL DISCLOSURES *(continued)*

A | RISK *(continued)*

Impact of Investment Returns on Unfunded Liability and Funded Ratio (Market Value Basis)

We have prepared a simple 5-year projection illustrating the potential impact of actual investment returns on funding levels. For this estimate, we used the market value of assets and did not attempt to develop an actuarial value of assets. In projecting the actuarial liability, we assumed the January 1, 2025 actuarial assumptions are exactly realized over the next 5 years and that there are no changes in assumptions over this period.

We first projected the market value of assets assuming the actual return for each of the next 5 years is 7.0% (the assumption used in the valuation). For comparison, we have also shown the results if the return were 3.0% each year. The 3.0% assumption is not intended to be a worst-case basis, but only to reflect the impact of a lower short-term return than the current plan assumption. As discussed earlier in the Executive Summary, projected returns are lower over the next 10 years than over the next 30 years.

	Valuation Date					
	2025	2026	2027	2028	2029	2030
UAL (in billions)						
7.00%	$14.0	$14.1	$14.2	$14.4	$14.5	$14.7
3.00%	$14.0	$15.6	$17.4	$19.3	$21.4	$23.6
Funded Ratio						
7.00%	73.5%	74.2%	74.9%	75.6%	76.2%	76.8%
3.00%	73.5%	71.4%	69.3%	67.1%	64.9%	62.7%

For this comparison, we assumed that for the 3.0% projections, the appropriation for the next 5 years would remain as in the current funding schedule (and the same as that if the actual returns were 7.0% per year). If returns were actually 3.0% per year, the funding schedule would need to be increased before FY30.

Cash Flow

Cash flow reflects receipts (primarily employee and employer contributions) less disbursements (primarily benefit payments and expenses). We use the information provided in the Annual Statement but subtract any investment income credit or excess investment income entries from the total receipts. Then we measure the ratio of receipts to disbursements. A ratio greater than 1.0 means receipts are greater than disbursements (positive cash flow). Likewise, a ratio less than 1.0 means receipts are less than disbursements (negative cash flow).

Most Massachusetts public systems have negative cash flow. This is not a significant issue for long-term funding but presents potential issues for short-term funding. All else being equal, over the short term, a negative cash flow produces a yearly funded ratio lower than it would have been if there were positive cash flow. This is because a portion of the investment earnings are being used to pay the net benefits and expenses. Therefore, less of the investment earnings are included in the end of the year value of the plan assets resulting in a lower MVA and a lower funded ratio. This may dampen funded ratio expectations somewhat when reviewing 5-year projections. This plan has a ratio of 0.74, 0.73, and 0.72 using the 2022, 2023 and 2024 Annual Statements respectively. Since the ratio is significantly less than 1.0, there may be an appreciable impact on our 5-year funded ratio projections.

8. ACTUARIAL DISCLOSURES *(continued)*

B | LOW-DEFAULT-RISK OBLIGATION MEASURE (LDROM)

For plan years after February 15, 2023, Actuarial Standard of Practice Number 4 (ASOP 4) requires the disclosure of a new liability measure. This measure is known as the Low-Default-Risk Obligation Measure (LDROM). The LDROM is calculated using a different discount rate than the discount rate used for funding purposes. The discount rate used for the LDROM is based on the short duration Financial Times Stock Exchange (FTSE) Pension Liability Index published as of December 31, 2024. The LDROM discount rate will typically be vastly lower than the discount rate based on the plan's actual investment portfolio. As a result, the LDROM will be significantly greater than the plan's funding liability. For the LDROM calculation, we used a discount rate of 5.44%.

The LDROM is not intended to be a measure of the plan's funding nor is it intended to be a measure of the plan's health. Most importantly, the LDROM is not the "true measure" of the plan's liabilities.

	(in thousands)
LDROM Liability as of January 1, 2025	$62,420,579
Funding Actuarial Accrued Liability as of January 1, 2025	$52,798,510

The LDROM helps understand the cost of investing in an all-bond portfolio and significantly lowering expected long-term investment returns. The funded status and Actuarially Determined Contributions are determined using the expected return on assets which reflects the actual investment portfolio. Benefit security for members of the plan relies on a combination of the assets in the plan, the investment returns generated on those assets and the promise of future contributions from the plan sponsors.

Since the assets are not invested in an all-bond portfolio, the LDROM does not indicate the funding status or progress, nor provide information on necessary plan contributions or the security of plan participants. The difference between the plan's Actuarial Accrued Liability and the LDROM can be thought of as representing the expected taxpayer savings from investing in the plan's diversified portfolio compared to investing only in high quality bonds.

C | REASONABLE ACTUARIALLY DETERMINED CONTRIBUTION (ADC)

For plan years after February 15, 2023, Actuarial Standard of Practice Number 4 (ASOP 4) also requires the disclosure of a reasonable Actuarially Determined Contribution (ADC). This reasonable ADC, if different from the Commonwealth's scheduled ADC, is not intended to be the Commonwealth's true funding measure. We believe that the Commonwealth's current schedule meets the requirements of a reasonable amortization method under ASOP 4. As such, the Commonwealth's reasonable ADC for FY26 is equal to the scheduled FY26 payment of $4.93 billion.

D | ACTUARIAL MODELS

The software used in our actuarial valuations measures the present value of the plan's actuarial liabilities from which we develop funding schedules that determine annual appropriations for each system. The software was created and is maintained by a national vendor of actuarial software. We have used this software for over 25 years. We periodically review the results of the software by analyzing detailed individual test lives and have compared our results to those of other actuaries using the same data set. The valuation output is prepared before a final review by the actuary.

In addition, we used a simple projection model prepared in a spreadsheet, to perform a rough analysis of the impact of investment returns on the unfunded actuarial liability and funded ratio for the next five years. The work is tailored to each valuation and reviewed by the actuary.

9. ACTUARIAL ASSUMPTIONS

Investment Return/Discount Rate

7.0% per year net of investment expenses *(same as the prior assumption)*

The investment return assumption is a long-term assumption and is based on capital market expectations by asset class, historical returns, and professional judgment. We considered analysis prepared by PRIM's investment advisor using a building block approach which included expected returns by asset class, risk analysis, and the determination of a 30-year expected target rate of return.

Discount Rate (for LDROM only)

5.44% (based on short duration FTSE Pension Liability Index published as of December 31, 2024)

Inflation

2.5% per year

Interest Rate Credited to the Annuity Savings Fund

3.5% per year

Assumed Rate of Cost-of-Living Increases (COLA)

3.0% per year (on the first $13,000 of an allowance)

Mortality

Pre-retirement mortality reflects the RP-2014 Blue Collar Employees table projected generationally with Scale MP-2021, set forward 1 year for females. *(Same as the prior assumption)*

Post-retirement mortality reflects the RP-2014 Blue Collar Healthy Annuitant table projected generationally with Scale MP-2021, set forward 1 year for females. *(Same as the prior assumption)*

For disabled retirees, mortality reflects the post-retirement mortality described in the previous paragraph, set forward 1 year. *(Same as the prior assumption)*

It is assumed that 75% of pre-retirement deaths are job-related for Group 1 and 2 members and 90% are job-related for Group 4 members. For members retired under an Accidental Disability, 40% of deaths are assumed to be from the same cause as the disability.

The mortality assumptions reflect our recent experience analysis published in 2014 (based on the years 2006-2011), updated to reflect actual experience from 2012 through 2016 for post-retirement mortality, and professional judgment. As such, this assumption reflects observed current mortality as well as expected mortality improvement.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Salary Increase

Service	Groups 1&2	Group 3	Group 4
0	7.00%	7.00%	9.00%
1	6.50%	7.00%	8.00%
2	6.00%	7.00%	7.50%
3	5.50%	7.00%	7.00%
4	5.50%	6.75%	6.75%
5	5.25%	6.25%	6.25%
6	5.00%	5.25%	5.75%
7	4.75%	4.75%	5.25%
8-12	4.75%	4.75%	4.75%
13-15	4.50%	4.75%	4.75%
16-19	4.25%	4.75%	4.75%
20+	4.00%	4.50%	4.50%

The salary increase assumption reflects both prior experience (2014 study) and professional judgment.

Withdrawal

Based on analysis of past experience. For Groups 1 and 2, rates are both age and service based for service up to 10 years. After 10 years, rates are age based. For Groups 3 and 4 rates are service based. Sample annual rates are shown below.

	Groups 1 & 2				Groups 3 & 4	
Age	Service			Service	Group 3	Group 4
	0	5	10+	0	0.007	0.090
20	0.270	0.120	0.045	5	0.007	0.060
30	0.230	0.100	0.045	10	0.005	0.035
40	0.160	0.080	0.030	15	0.005	0.020
50	0.180	0.060	0.030	20+	0.005	0.015

See the next page for an explanation of withdrawal rates for employees hired on or after April 2, 2012.

Withdrawal rates are based on our most recent experience analysis (2014) which reviewed age, gender and job group. Final assumptions reflect this analysis as well as professional judgment.

Disability

Based on an analysis of past experience. It is also assumed that the percentage of job-related disabilities is 75% for Group 1 and 2 members and 95% for Group 3 and 4 members.

Age	Group 1	Group 2	Group 3	Group 4
20	0.00010	0.00052	0.0010	0.0020
30	0.00010	0.00072	0.0016	0.0021
40	0.00068	0.00210	0.0036	0.0071
50	0.00133	0.00420	0.0094	0.0110
60	0.00120	0.00500	0.0430	0.0080

Disability rates are based on our most recent experience analysis (2014) which reviewed age, gender and job group. Final assumptions reflect this analysis as well as professional judgment.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Loading and Administrative Expenses

We increased the normal cost by 2% and the actuarial accrued liability of active members by 1.75% to account for certain Chapter 32 benefits that cannot be readily valued with our software system. Such benefits include, but are not limited to, benefits provided under Sections 10, 28M, 28N, 65D, and 100. In addition, we increased the normal cost by 1.5% and the actuarial accrued liability of active members by 0.75% to estimate the impact of potential changes in job group status for certain members of DMH and Social Services.

Members Hired on or After April 2, 2012

Chapter 176 of the Acts of 2011 changed the retirement eligibility for the different job groups. For example, Group 1 eligibility changed from 55 years old with 10 years of service to 60 years old with 10 years of service (Chapter 176 removed the provision that allowed retirement at any age with 20 years of service). Our software system is programmed such that at any given age, a member is assumed to either retire or terminate, but not both. Therefore, we adjusted the retirement and termination rates for members impacted by Chapter 176. For example, for Group 1 members, we removed retirement rates for ages 50-59. Termination rates remain in effect for those years. We will monitor these assumptions going forward.

Retirement

	Group 1		Group 2	Group 3	Group 4
Age	Male	Female			
45-49	0.000	0.000	0.010		
50	0.010	0.015	0.020		
51	0.010	0.015	0.020		
52	0.010	0.020	0.020		
53	0.010	0.025	0.050		
54	0.020	0.025	0.075		
55	0.020	0.055	0.150		
56	0.025	0.065	0.100		
57	0.025	0.065	0.100		
58	0.050	0.065	0.100		
59	0.065	0.065	0.150		
60	0.120	0.050	0.200		
61	0.200	0.130	0.200		
62	0.300	0.150	0.250		
63	0.250	0.125	0.250		
64	0.220	0.180	0.300		
65	0.400	0.150	1.000		
66	0.250	0.200	1.000		
67	0.250	0.200	1.000		
68	0.300	0.250	1.000		
69	0.300	0.200	1.000		
70 and after	1.000	1.000	1.000		

Retirement rates are based on our most recent experience analysis which reviewed age, service, gender and job group. The assumption reflects this analysis as well as professional judgment.

10. SUMMARY OF PLAN PROVISIONS

ADMINISTRATION

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

PARTICIPATION

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

There are 4 classes of membership under Chapter 32, but one of these classes, Group 3, is made up exclusively of the State Police who are in the State Retirement System. The other 3 classes are as follows:

Group 1:

General employees, including clerical, administrative, technical and all other employees not otherwise classified.

Group 2:

Certain specified hazardous duty positions.

Group 3:

Officers and inspectors of the Department of State Police.

Group 4:

Police officers, firefighters, and other specified hazardous positions.

MEMBER CONTRIBUTIONS

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

Prior to 1975:	5% of regular compensation
1975 - 1983:	7% of regular compensation
1984 to 6/30/96:	8% of regular compensation
7/1/96 to present:	9% of regular compensation
	12% of regular compensation for State Police officers
1979 to present:	an additional 2% of regular compensation in excess of $30,000.

In addition, members of Group 1 who join the system on or after April 2, 2012 will have their withholding rate reduced to 6 % after achieving 30 years of creditable service.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

RATE OF INTEREST

Interest on regular deductions made after January 1, 1984 is a rate established by PERAC in consultation with the Commissioner of Banks. The rate is obtained from the average rates paid on individual savings accounts by a representative sample of at least 10 financial institutions.

RETIREMENT AGE

The mandatory retirement age for some Group 2 and Group 4 employees is age 65. Most Group 2 and Group 4 members may remain in service after reaching age 65. Group 2 and Group 4 members who are employed in certain public safety positions are required to retire at age 65. There is no mandatory retirement age for employees in Group 1.

SUPERANNUATION RETIREMENT

A person who became a member before April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- completion of 20 years of service, or
- attainment of age 55 if hired prior to 1978, or if classified in Group 4, or
- attainment of age 55 with 10 years of service, if hired after 1978, and if classified in Group 1 or 2

A person who became a member on or after April 2, 2012 is eligible for a superannuation retirement allowance (service retirement) upon meeting the following conditions:

- attainment of age 60 with 10 years of service if classified in Group 1, or
- attainment of age 55 with 10 years of service if classified in Group 2, or
- attainment of age 55 if classified in Group 4.

AMOUNT OF SUPERANNUATION BENEFIT

A member's annual allowance is determined by multiplying average salary by a benefit rate related to the member's age and job classification at retirement, and the resulting product by his creditable service. The amount determined by the benefit formula cannot exceed 80% of the member's highest three year (or five year salary as discussed below) average salary. For veterans as defined in G.L. c. 32, s. 1, there is an additional benefit of $15 per year for each year of creditable service, up to a maximum of $300.

- Salary is defined as gross regular compensation. For persons who become 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 persons who became members prior to April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 3 consecutive years that produce the highest average, or, if greater, during the last 3 years (whether or not consecutive) preceding retirement.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

AMOUNT OF BENEFIT *(continued)*

• For persons who became members on or after April 2, 2012, Average Salary is the average annual rate of regular compensation received during the 5 consecutive years that produce the highest average, or, if greater, during the last 5 years (whether or not consecutive) preceding retirement.

• The Benefit Rate varies with the member's retirement age. For persons who became members prior to April 2, 2012 the highest rate of 2.5% applies to Group 1 employees who retire at or after age 65, Group 2 employees who retire at or after age 60, and to Group 4 employees who retire at or after age 55. A .1% reduction is applied for each year of age under the maximum age for the member's group. For Group 2 employees who terminate from service under age 55, the benefit rate for a Group 1 employee shall be used.

• For persons who became members on or after April 2, 2012 and retire with less than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .15% reduction is applied for each year of age under the maximum age for the member's group.

• For persons who became members on or after April 2, 2012 and retire with more than 30 years of creditable service, the highest rate of 2.5% applies to Group 1 employees who retire at or after age 67, Group 2 employees who retire at or after age 62, and to Group 4 employees who retire at or after age 57. A .125% reduction is applied for each year of age under the maximum age for the member's group.

• The allowance of State Police officers is calculated using a slightly different formula. Information regarding this formula can be obtained directly from the State Retirement Board.

DEFERRED VESTED BENEFIT

A participant who has attained the requisite years of creditable service can elect to defer his or her retirement until a later date. Certain public safety employees cannot defer beyond age 65. All participants must begin to receive a retirement allowance or withdraw their accumulated deductions no later than April 15 of the calendar year following the year they reach age 73.

WITHDRAWAL OF CONTRIBUTIONS

Member contributions may be withdrawn upon termination of employment. The interest rate for employees who first become members on or after January 1, 1984 who voluntarily withdraw their contributions with less than 10 years of service will be 3%. Interest payable on all other withdrawals will be set at regular interest.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

DISABILITY RETIREMENT

The Massachusetts Retirement Plan provides 2 types of disability retirement benefits:

ORDINARY DISABILITY

Eligibility: Non-veterans who become totally and permanently disabled by reason of a non-job-related condition with at least 10 years of creditable service (or 15 years creditable service in systems in which the local option contained in G.L. c. 32, s.6(1) has not been adopted).

Veterans with ten years of creditable service who become totally and permanently disabled by reason of a non-job-related condition prior to reaching "maximum age". "Maximum age" applies only to employees classified in Group 4 who are subject to mandatory retirement.

Retirement Allowance: For persons who became members prior to April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

For persons in Group 1 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 60. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 60, he or she will receive not less than the superannuation allowance to which he or she would have been entitled had they retired for superannuation.

For persons in Group 2 and Group 4 who became members on or after April 2, 2012, the benefit is equal to the accrued superannuation retirement benefit as if the member was age 55. If the member is a veteran, the benefit is 50% of the member's final rate of salary during the preceding 12 months, plus an annuity based upon accumulated member contributions plus credited interest. If the member is over age 55, he or she will receive not less than the superannuation allowance to which he or she is entitled.

ACCIDENTAL DISABILITY

Eligibility: Applies to members who become permanently and totally unable to perform the essential duties of the position as a result of a personal injury sustained or hazard undergone while in the performance of duties. There are no minimum age or service requirements.

Retirement Allowance: 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay. For those who became members in service after January 1, 1988 or who have not been members in service continually since that date, the amount is limited to 75% of pay. There is an additional pension of $1,125.36 per year, per child who is under 18 at the time of the member's retirement, with no age limitation if the child is mentally or physically incapacitated from earning. The additional pension may continue up to age 22 for any child who is a full-time student at an accredited educational institution. For systems that have adopted Chapter 157 of the Acts of 2005, veterans as defined in G.L. c. 32, s. 1 receive an additional benefit of $15 per year for each year of creditable service, up to a maximum of $300.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

ACCIDENTAL DEATH

Eligibility: Applies to members who die as a result of a work-related injury or if the member was retired for accidental disability and the death was the natural and proximate result of the injury or hazard undergone on account of which such member was retired.

Allowance: An immediate payment to a named beneficiary equal to the accumulated deductions at the time of death, plus a pension equal to 72% of current salary and payable to the surviving spouse, dependent children or the dependent parent, plus a supplement of $1,125.36 per year, per child, payable to the spouse or legal guardian until all dependent children reach age 18 or 22 if a full time student, unless mentally or physically incapacitated.

The surviving spouse of a member of a police or fire department or any corrections officer who, under specific and limited circumstances detailed in the statute, suffers an accident, and is killed or sustains injuries while in the performance of his duties that results in his death, may receive a pension equal to the maximum salary for the position held by the member upon his death.

In addition, an eligible family member may receive a one-time payment of $300,000.00 from the State Retirement Board.

DEATH AFTER ACCIDENTAL DISABILITY RETIREMENT

Effective November 7, 1996, Accidental Disability retirees were allowed to select Option C at retirement and provide a benefit for an eligible survivor. For Accidental Disability retirees prior to November 7, 1996, who could not select Option C, if the member's death is from a cause unrelated to the condition for which the member received accidental disability benefits, a surviving spouse will receive an annual allowance of $12,000.

DEATH IN ACTIVE SERVICE *(OPTION D)*

Allowance: An immediate allowance equal to that which would have been payable had the member retired and selected Option C on the day before his or her death. For a member who became a member prior to April 2, 2012 whose death occurred prior to the member's minimum superannuation retirement age, the age 55 benefit rate is used. For a member classified in Group 1 who became a member on or after April 2, 2012 whose death occurred prior to the member's minimum superannuation retirement age, the age 60 benefit rate is used. If the member died after age 60, the actual age is used. For a member classified in Group 2 or Group 4 who became a member on or after April 2, 2012 and whose death occurred prior to the member's minimum superannuation retirement age, the benefit shall be calculated using an age 55 factor. The minimum annual allowance payable to the surviving spouse of a member in service who dies with at least two years of creditable service is $6,000, provided that the member and the spouse were married for at least one year and living together on the member's date of death.

The surviving spouse of such a member in service receives an additional allowance equal to the sum of $1,440 per year for the first child and $1,080 per year for each additional child until all dependent children reach age 18 or 22 if a full-time student, unless mentally or physically incapacitated.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

COST OF LIVING

A cost of living adjustment (COLA) is determined based on the increase in the Consumer Price Index (CPI) used for indexing Social Security benefits, but cannot exceed 3.0% of the first $13,000 of a retiree's benefit.

METHODS OF PAYMENT

A member may elect to receive his or her retirement allowance in one of 3 forms of payment.

Option A: Total annual allowance, payable in monthly installments, commencing at retirement and terminating at the member's death.

Option B: A reduced annual allowance, payable in monthly installments, commencing at retirement and terminating at the death of the member, provided, however, that if the total amount of the annuity portion received by the member is less than the amount of his or her accumulated deductions, including interest, the difference or balance of his accumulated deductions will be paid in a lump sum to the retiree's beneficiary or beneficiaries of choice.

Option C: A reduced annual allowance, payable in monthly installments, commencing at retirement. At the death of the retired employee, 2/3 of the allowance is payable to the member's designated beneficiary (who may be the spouse, or former spouse who is unmarried at the time of retirement for a member whose retirement becomes effective on or after February 2, 1992, child, parent, sister, or brother of the employee) for the life of the beneficiary. For members who retired on or after January 12, 1988, if the beneficiary pre-deceases the retiree, the benefit payable increases (or "pops up" to Option A) based on the factor used to determine the Option C benefit at retirement. For members who retired prior to January 12, 1988, if the System has accepted Section 288 of Chapter 194 of the Acts of 1998 and the beneficiary pre-deceases the retiree, the benefit payable "pops up" to Option A in the same fashion. The Option C became available to accidental disability retirees on November 7, 1996.

ALLOCATION OF PENSION COSTS

If a member's total creditable service was partly earned by employment in more than one retirement system, the cost of the "pension portion" is allocated between the different systems pro rata based on the member's service within each retirement system. If a member received regular compensation concurrently from two or more systems on or after January 1, 2010, and was not vested in both systems as of January 1, 2010, such a pro-ration will not be undertaken. This is because such a person will receive a separate retirement allowance from each system.

11. GLOSSARY OF TERMS

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

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

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

Actuarial Gain or Loss (or Experience Gain or Loss) – A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates.

> **Note:** The effect on the Accrued Liability and/or the Normal Cost resulting from changes in the Actuarial Assumptions, the Actuarial Cost Method, or pension plan provisions would be described as such, not as an Actuarial Gain (Loss).

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

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

Annual Statement - The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 3l and the transactions during the calendar year that affected the financial condition of the retirement system.

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

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

Assets – The value of securities as described in Section 8.

Cost of Benefits – The estimated payment from the pension system for benefits for the fiscal year. This was the minimum amount payable during the first six years of some funding schedules.

Funding Schedule – The schedule based upon the most recently approved actuarial valuation which sets forth the amount which would be appropriated to the pension system in accordance with Section 22(6A), Section 22D or Section 22F of M.G.L. Chapter 32.

GASB – Governmental Accounting Standards Board

Normal Cost – Total Normal Cost is that portion of the Actuarial Present Value of pension plan benefits, which is to be paid in a single fiscal year. The Employee Normal Cost is the amount of the expected employee contributions for the fiscal year. The Employer Normal Cost is the difference between the Total Normal Cost and the Employee Normal Cost.

11. GLOSSARY OF TERMS *(continued)*

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

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

Present Value of Future Benefits - The value on the valuation date of all of the future benefits that are expected to be paid to members of the System discounted with interest and the probability of benefit receipt

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

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

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