Commonwealth

Actuarial Valuation Report

January 1, 2017

PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION
COMMONWEALTH OF MASSACHUSETTS

COMMONWEALTH ACTUARIAL VALUATION REPORT

January 1, 2017

TABLE OF CONTENTS

1. INTRODUCTION & CERTIFICATION

This report presents the results of the actuarial valuation of the pension benefits that are the obligation of the Commonwealth of Massachusetts. The four components are:

- State Employees' Retirement System (SRS)
- Massachusetts Teachers' Retirement System (TRS)
- Boston Teachers
- Cost of Living Allowance Reimbursements to Local Systems

The valuation was performed as of January 1, 2017 pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts, and is based on the plan provisions in effect at that time. The actuarial assumptions used to calculate the actuarial accrued liability and the normal cost reflect our latest experience studies of SRS and TRS and our analysis of retiree mortality during 2015 and 2016.

This valuation is based on member data as of December 31, 2016, which was supplied by the State, Massachusetts Teachers', and Boston Retirement Boards. We performed a number of tests on the data to ensure reasonableness and made specific assumptions for a number of Massachusetts Teacher data items. Asset information as of December 31, 2016 was provided by the Pension Reserves Investment Management (PRIM) Board. We reviewed both the membership data and financial information for reasonableness but we did not audit this information.

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.

I am a member of the American Academy of Actuaries and meet the Qualification Standards of the Academy to render the actuarial opinion contained in this report. In my opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent my best estimate of anticipated experience. I believe this report represents an accurate appraisal of the actuarial status of the Commonwealth's total pension obligation 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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Joseph E. Connarton
Executive Director

September 20, 2017

2. EXECUTIVE SUMMARY

PART 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 SRS, TRS, liabilities for Boston teachers, and State reimbursements to local systems to reflect COLAs granted from 1982 through 1996 are the components of the Commonwealth schedule. 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, 2017 and was based on the results of the January 1, 2016 Commonwealth Actuarial Valuation. The FY18 appropriation under the schedule is $2.394 billion. The total appropriation under the schedule will increase 8.94% each year until FY36. The amortization of the 2015 Early Retirement Incentive (ERI) will be completed in FY27. If the actuarial assumptions are exactly realized and there are no changes in the assumptions or plan provisions each year, the UAL is scheduled to increase until FY24 before decreasing each year until FY36.

In the 2014 and prior actuarial valuations, the Annual Required Contribution (ARC) was developed under GASB 27 for accounting purposes. The ARC was developed using the minimum allowable schedule for local systems under Chapter 32 (UAL amortized on a 4.0% annual increasing basis to FY40). This ARC calculation is no longer applicable for GASB purposes, but we show it for comparison. Using the ARC basis and the January 1, 2017 valuation results, the FY18 appropriation would be approximately $3.292 billion. Therefore, the FY18 appropriation is 72.7% of the ARC ($2.394B/$3.292B). Had there been no assumption changes in this valuation, this figure would have been about 76%. Based on the 2016 valuation results, the FY17 appropriation was 71.8% of the ARC. We expect this percentage to generally increase each year until ultimately the appropriation exceeds the ARC, although changes to the actuarial assumptions and actuarial gains or losses could affect this result.

The principal results of the January 1, 2017 actuarial valuation are as follows (in thousands):

Total Normal Cost	$1,802,008
Expected Employee Contributions	1,250,904
Net Normal Cost	$551,104
Total Expenses and Transfers	$90,700
Net Normal Cost Plus Expenses	$641,804

Total Actuarial Liability	$91,573,998
Assets	$51,952,206
Unfunded Actuarial Liability	$39,621,792
Funded Ratio	56.7%

2. EXECUTIVE SUMMARY *(continued)*

PART B | COMPARISON WITH PRIOR VALUATION AND EXPERIENCE ANALYSIS

A comparison of the results of the current valuation and the January 1, 2016 valuation is shown below. (Dollars in thousands)

	1/1/17	1/1/16	Increase (Decrease)	Increase (Decrease)
Total Normal Cost	$1,802,008	$1,715,159	$86,849	5.1%
Expected Employee Contributions	1,250,904	1,212,634	38,270	3.2%
Net Normal Cost	$551,104	$502,525	$48,579	9.7%
Administrative Expenses	$51,800	$46,000	$5,800	12.6%
Optional Retirement Plan Transfer	18,600	17,500	1,100	6.3%
3(8)(c) Amounts Transferred to Other Systems	20,300	16,000	4,300	26.9%
Total Expenses and Transfers	$90,700	$79,500	$11,200	14.1%
Net Normal Cost Plus Expenses and Transfers	$641,804	$582,025	$59,779	10.3%
Actuarial Liability				
Actives	38,006,074	$36,535,981	$1,470,093	4.0%
Retirees and Inactives	53,567,924	50,865,741	2,702,183	5.3%
Total	91,573,998	$87,401,722	$4,172,276	4.8%
Assets (Actuarial Value)	51,952,206	49,535,323	2,416,883	4.9%
Unfunded Actuarial Liability	39,621,792	$37,866,399	$1,755,393	4.6%
Funded Ratio	56.7%	56.7%	0.0%	

In prior valuations, we included total expenses and transfers in the total normal cost and net normal cost. For this valuation, we have shown the expense and transfer items separately. Administrative expenses reflect the expenses from the most recent Annual Statement excluding investment related expenses and the estimated Optional Retirement Plan (ORP) transfer which is shown separately for the SRS. The ORP transfer is the amount transferred by statute from the SRS to the ORP for higher education employees. By including this transfer with the normal cost, we have treated it as a reimbursement to the pension trust fund. Finally, $20.3 million is included for amounts transferred to other systems under Section 3(8)(c) for members with SRS and TRS service who retired from another system. Historically, Section 3(8)(c) receipts from other systems have been 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)*

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

Gain/(Loss) and Change in Unfunded Actuarial Liability (UAL)
The development of the actuarial gain/(loss) is shown in Section 4. During 2016, there was an overall actuarial gain of $1.1 billion. There was a non-investment related gain on actuarial liability of approximately $595 million and a gain on assets (on an actuarial value basis) of approximately $522 million. The return on assets was approximately 8.6% on an AVA basis compared to 8.1% on a market value basis.

PERAC values 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. The calculated AVA as of January 1, 2017 is 101.7% of the market value and is within the specified corridor.

The UAL increased from $37.9 billion as of January 1, 2016 to $39.6 billion as of January 1, 2017. The UAL would have only increased to $38.0 billion and the funded ratio would have been 57.7% had there been no changes in actuarial assumptions (see next section).

Actuarial Assumptions
The January 1, 2017 report uses a 7.50% investment return assumption which is the same as the January 1, 2016 report. The investment return assumption had previously decreased from 8.25% as of January 1, 2012 to 7.5% as of January 1, 2016. As part of this valuation, we considered whether to maintain the 7.50% assumption or reduce it further.

Earlier this year, NEPC, PRIM's investment consultant, completed its annual study of expected returns on both a short-term and long term basis. The results showed a 30-year average annual expected return of 7.8%. The 5-7 year expected return is 6.8%. We believe both a 7.50% assumption and a slightly lower assumption (7.25% to 7.40%) are in a reasonable range as of January 1, 2017. We maintained the 7.50% assumption in this valuation. However, we note that not adjusting the assumption in this valuation makes it more likely we will recommend this assumption be reduced as of January 1, 2018. For comparison, if a 7.40% investment return assumption were used in this valuation, the UAL would be approximately $40.5 billion and the funded ratio would be approximately 56.2%.

In our 2011 actuarial valuation, we began reflecting future mortality improvement (longer life expectancy). Each year we modified this assumption as we moved closer to a fully generational mortality assumption (a two dimensional table based on a member's age and calendar year that includes all expected future mortality improvements). Based on our analysis in early 2015 of State retiree mortality during 2012, 2013, and 2014, we adopted a fully generational assumption in the 2015 valuation. Based on our 2017 analysis of State and Teacher retiree mortality during 2015 and 2016, we adjusted the mortality assumption in this valuation.

The mortality assumption used for SRS in prior valuations is a version of the RP-2000 Mortality Table. We have used a number of versions of this table for 15 years including a fully generational table since 2015. In our 2015 analysis, we compared our actual retiree mortality to a more recent table known as the RP-2014 table. We found the base RP-2014 table did not match our experience so we maintained the RP-2000 table at that time. For TRS and Boston Teachers, the RP-2014 table was adopted as part of the 2015 valuation.

For the SRS, our 2017 analysis showed female deaths, in total, were about as expected. However, actual deaths were less than expected at all ages between 65 and 75, and greater than expected at all ages after 80. The male results showed actual deaths less than expected. Based on these results, we decided to adjust the male table. Since we need to revise the male table, we also looked for a table to better match our results at individual ages for both males and females.

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

The table we adopted for the SRS in this valuation is based on a blue collar version of the RP-2014 table. The mortality assumption is the fully generational RP-2014 Blue Collar table, with Mortality Improvement Scale MP-2016, with females set forward 1 year. The actuarial liability increased $304 million due to this change.

For the TRS, our 2017 analysis showed deaths were less than expected and we noted significant mortality improvement from our analysis two years ago. It is not clear whether this improvement reflects longer life expectancy, possible data issues in prior years, or an aberration. A review of 10 other state teacher plans found that four of those plans use a similar assumption to our recommendation and this assumption appears to be more conservative than the six other plans. However, we note that the 2015 and 2016 mortality experience was better than the recommended assumption. Therefore, there may be another assumption change in the next two years that increases plan liabilities. We recommend a white collar version of the RP-2014 table. The mortality assumption is the fully generational RP-2014 White Collar table with Mortality Improvement Scale MP-2016. The actuarial liability increased $1.2 billion due to this change.

We used the same assumption for Boston teachers. The actuarial liability increased $94 million to reflect this change.

Early Retirement Incentive
Chapter 79 of the Acts of 2014 established an early retirement incentive (ERI) program for certain employees of the highway division of the Department of Transportation whose positions have been eliminated due to the cessation of manual toll collection. The law provided that eligible members who elected to participate had their retirement allowances determined by adding 5 years to age and/or creditable service (any combination in full years). Most members retiring under the ERI had a date of retirement of October 28, 2016. The ERI was taken by 112 members who retired during 2016. The increase in actuarial liability as of January 1, 2017, due to the toll collector ERI is $10.4 million.

Optional Retirement Plan transfers
Chapter 176 of the Acts of 2011, *An Act Providing for Pension Reform and Benefit Modernization* made a number of changes to the Chapter 32 pension law. One of the changes concerns the Optional Retirement Plan (ORP), a defined contribution plan for higher education employees. The law provided a one-time opportunity for ORP members (and former ORP members) to transfer to the State Retirement System (SRS) and purchase service for the period while subject to the ORP. The amount of payments required is the greater of the ORP balance less employer funded contributions and the amount that would have otherwise been paid into the SRS had these employees been members of the SRS plus interest for the period spent as an active member of the ORP.

Due to concerns regarding potential plan qualification issues with respect to this provision, the State requested a private letter ruling from the Internal Revenue Service (IRS) on issues concerning the taxation of the transferred assets, transfer of participation, and treatment of future employee contributions in both plans. In September, 2013, the IRS responded favorably to the request and the process of transfers began.

For the 2016 valuation, we estimated the liability of these members since the data provided was incomplete with respect to the number of members who transferred, credited service, and assets to be transferred from the ORP to SRS. In the 2017 valuation, approximately 1,375 members formerly in the ORP were included in the data provided to us (most are on the active file). This year, the data for these members appears to reflect the full transfer of service and assets to the SRS.

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

Job groups

We noted several issues relating to job group as part of the valuation data we received from SRS. A number of members are coded as Job Group 1 but we believe these members should be coded as Job Group 2. This list consists of approximately 5,200 members in the Department of Mental Health (DMH), Social Services and University of Massachusetts Police (only UMass Dartmouth police were coded as Group 2 in the data submission). In addition, it appears there are 446 State Police who are coded as Group 1 but should be coded as Group 3. As we noted in last year's valuation, these State Police members are not contributing at the 12% contribution rate we would expect for State Police hired after July 1, 1996.

We adjusted the job group for DMH, Social Services, UMass Police and State Police in our files. We made these same adjustments in the 2016 valuation except Social Services members were already coded as Group 2 in last years' data. DMH members with certain titles and Social Services workers with 10 years of service in certain capacities are eligible to be in Group 2. By assuming these members will ultimately be in Group 2, we are being somewhat conservative. Based on our discussions with SRS, most of these members will ultimately be eligible for Group 2 status. After these adjustments, the actuarial liability is approximately $135 million greater than the results using the data as provided.

Other Chapter 176 issues

There are several other changes under Chapter 176 that we have discussed in previous valuations that 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, 2017, there were approximately 49,800 members hired after April 1, 2012. Since these members have less than four years of service and are generally young, there is still relatively little impact on plan costs (on a percentage basis) in this valuation. The employer normal cost is approximately $60 million lower than it would have been if the prior provisions were in place for these members. The actuarial liability is approximately $225 million lower than it would have been if the prior provisions were in place.

Teachers

We have detailed a number of the assumptions we made for missing or questionable data for active members of the TRS in Part C of Section 7.

TRS implemented a new software system with the data submission for the January 1, 2014 valuation. As part of the 2014 and 2015 valuations, we identified several issues that TRS subsequently reviewed prior to the January 1, 2016 data submission. The data submissions for the 2016 and 2017 valuations improved from prior submissions.

Boston Teachers

The Boston Retirement System (BRS) also implemented a new system with the data submission for the January 1, 2014 valuation. As part of the 2014 valuation, we identified several issues that BRS subsequently reviewed prior to the January 1, 2015 data submission. The data submission for this valuation has once again improved.

2. EXECUTIVE SUMMARY *(continued)*

PART 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, 2017. We believe these measures alone are not appropriate for assessing the sufficiency of assets to cover the estimated cost of settling the Commonwealth'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 1990's, the UAL actually decreased until January 1, 2000.

It is important to note that plan assets have grown faster than plan liabilities, despite recent assumption changes and plan amendments outlined on the next page that have increased plan liabilities. As of January 1, 1990, the actuarial liability was $20.0 billion and assets were $7.8 billion. The difference of $12.2 billion was the UAL. As of January 1, 2017, the actuarial liability is $91.6 billion and the actuarial value of assets is $52.0 billion. The difference of $39.6 billion is the UAL. The actuarial liability has grown 4.6 times over this period ($91.6B / $20.0B). But assets have grown 6.7 times over this same period ($52.0B / $7.8B).

For this reason, we believe the funded ratio represents a better measure of the Commonwealth's progress. If you draw a straight line from the 1990 funded ratio of 39.0% to the January 1, 2017 amount of 56.7%, the line is moving upward to the right. This demonstrates the funding progress to date despite significant assumption and plan changes since 2009 (see page 8). Similar changes made prior to 2009 have also dampened funding progress. Although the funded ratio reached 85.2% on January 1, 2000, this was the result of average annual returns from 1985-1999 that exceeded 12.5% and attaining such a high level of funding so quickly was not expected. Over the past 17 years (2000-2016), the average annual return on assets on a market value basis is approximately 5.9%. Over a 10-year and 5-year period, the returns have been 5.0% and 9.2% respectively. The 32-year return (since inception) is 9.4%. All returns are shown gross of investment fees.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDING PROGRESS *(continued)*

The actuarial liability as of January 1, 2017 increased $1.574 billion to reflect revised mortality assumptions and $10.4 million for the toll collector ERI. There have been a number of other plan and assumption changes since 2009 that have increased the actuarial liability. These changes include three separate reductions in the investment return assumption and annual adjustments to the mortality assumption prior to the change to a fully generational assumption as of January 1, 2015. The other changes include the adoption of a $13,000 COLA base, the transfer of active members of sheriff departments in six counties to the SRS, the transfer of former members of the Massachusetts Turnpike Authority Retirement System to the SRS, the transfer of ORP members to the SRS, and the 2015 Early Retirement Incentive. Including the changes as of January 1, 2017, the unfunded actuarial liability is approximately $11.3 billion greater than it would have been using the 2009 valuation assumptions and plan provisions. Therefore, on a comparable basis with 2009, the UAL on January 1, 2017 would be $28.4 billion and the funded ratio would be 64.7%.

Change in Unfunded Actuarial Liability since 2009 Valuation (in billions)

	State	Mass. Teachers	Boston Teachers	Total
Assumption Changes	$3.12	$6.19	$0.51	$9.82
Plan Amendments	1.14	0.15	0.14	1.43
Total	$4.26	$6.34	$0.65	$11.25

Assumption changes (with valuation date reflected) (in millions)

Reduction in investment return assumption from 8.25% to 8.0% (2013)	$1,670
Reduction in investment return assumption from 8.0% to 7.75% (2015)	1,947
Reduction in investment return assumption from 7.75% to 7.50% (2016)	2,218
Adoption of fully generational mortality assumption (2015)	1,700
Other mortality adjustments (2012, 2013, 2014)	1,050
Mortality adjustment (2017)	1,574
Other experience study changes (2013)	(335)
Total	$9,824

Plan amendments (with valuation date reflected)

Transfer of Massachusetts Turnpike Authority (2010)	$136
Transfer of sheriff departments (2011)	225
Boston Teachers (2011)	127
$13,000 COLA base (2012)	298
Early Retirement Incentive (2016)	230
Transfer of ORP members (2016)	400
Early Retirement Incentive for toll collectors (2017)	10
Total	$1,426

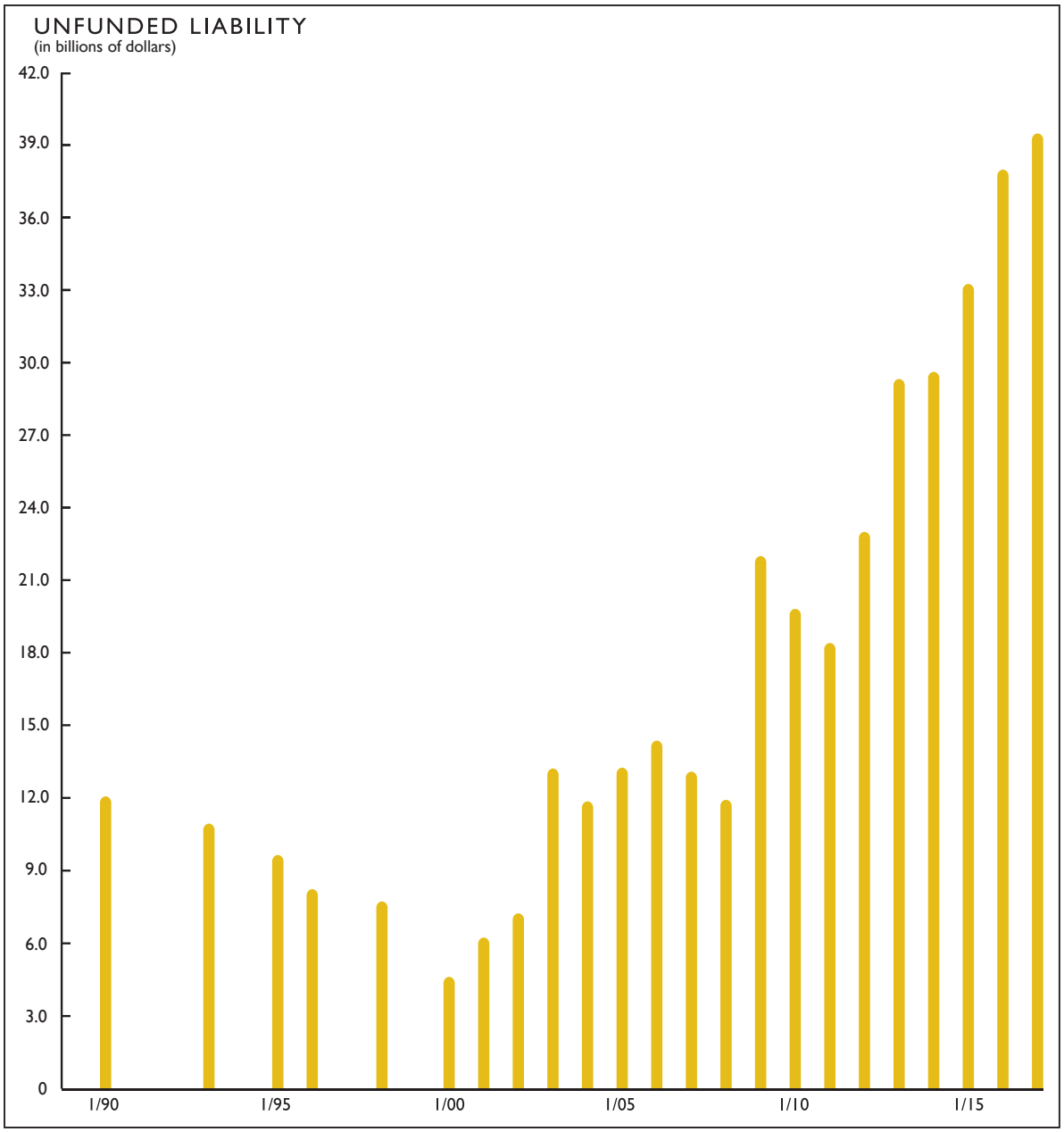
PART C | FUNDING PROGRESS *(continued)*

UNFUNDED LIABILITY

The chart below shows the Commonwealth's unfunded actuarial accrued liability (UAL) since 1990. The UAL represents the actuarial accrued liability less the actuarial value of plan assets. When there is no UAL, a system is said to be "fully funded." In this exhibit, for years prior to 2000, the figures were estimated to reflect implementation of updated actuarial software.

Based on the current funding schedule, if the actuarial assumptions are exactly realized and there are no changes in the assumptions or plan provisions each year, the UAL is scheduled to increase until FY24 before decreasing each year until FY36.

On a market value basis, the UAL is $40.5 billion.



2. EXECUTIVE SUMMARY *(continued)*

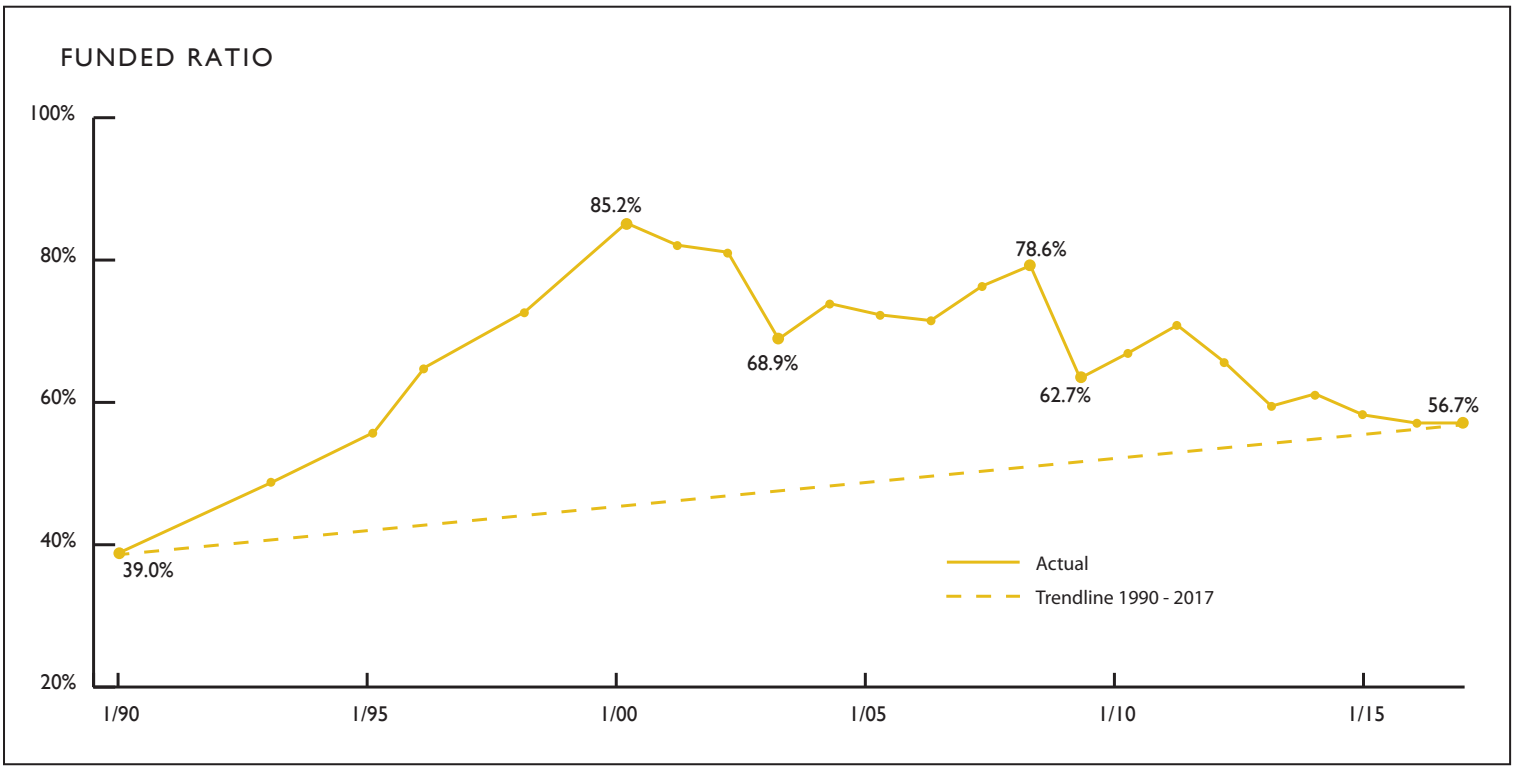
PART C | FUNDING PROGRESS *(continued)*

FUNDED RATIO

The chart below shows the Commonwealth's funded ratio progress since 1990. The funded ratio represents the actuarial value of plan assets divided by the actuarial accrued liability. When the funded ratio reaches 100%, a system is said to be "fully funded." In this exhibit, for years prior to 2000, the figures were estimated to reflect implementation of updated actuarial software.

Based on the current funding schedule, if the actuarial assumptions are exactly realized and there are no changes in the assumptions or plan provisions each year, the funded ratio will reach 100% in FY36.

On a market value basis, the funded ratio is 55.8%.

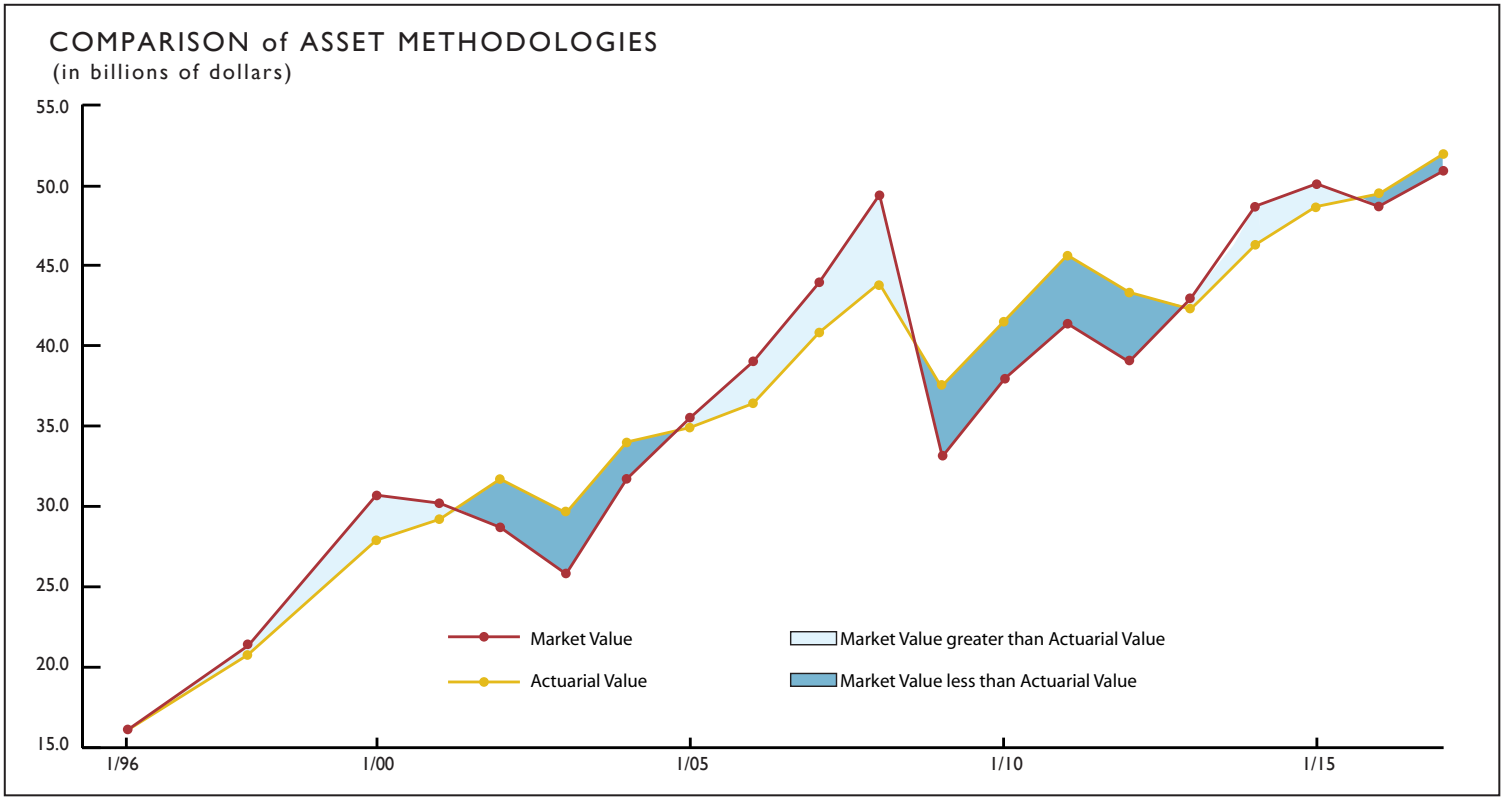


2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDING PROGRESS *(continued)*

COMPARISON OF MARKET AND ACTUARIAL VALUE OF ASSETS

In valuations prior to 1998, plan assets were determined at market value. As part of the 1998 valuation, this methodology was adjusted to reduce the potential volatility in the market value approach from year to year. The actuarial value of assets recognizes investment gains and losses over a five-year period. Therefore, in some years the actuarial value will be less than the market value, and in other years, the actuarial value will exceed the market value.



3. SUMMARY OF VALUATION RESULTS

(Dollars in thousands)

A. Number of Members	State	Mass. Teachers	Boston Teachers	Local COLA	Total
Active	90,014	92,128	6,479		188,621
Vested Terminated	4,094	0	0		4,094
Retired/ Beneficiaries	62,259	65,036	4,688		131,983
Total	156,367	157,164	11,167		324,698
B. Total Payroll	$5,927,012	$6,583,871	$548,826		$13,059,709
C. Normal Cost					
Superannuation	$587,678	$748,746	$61,024		$1,397,448
Death	87,202	24,544	1,954		113,700
Disability	66,648	31,454	894		98,996
Termination	90,794	91,960	9,110		191,864
Total Normal Cost	$832,322	$896,704	$72,982		$1,802,008
Expected Employee Contributions	530,597	664,890	55,417		1,250,904
Net Employer Normal Cost	$301,725	$231,814	$17,565		$551,104
Administrative Expenses	$20,600	$24,200	$7,000		$51,800
Optional Retirement Plan Transfer	18,600	0	0		18,600
3(8)(c) Amounts Transferred to Other Systems	16,000	4,300	0		20,300
Total Expenses and Transfers	$55,200	$28,500	$7,000		$90,700
Net Normal Cost Plus Expenses & Transfers	$356,925	$260,314	$24,565		$641,804
D. Actuarial Liability					
Active					
Superannuation	$15,512,422	$19,012,007	$1,363,138		$35,887,567
Death	383,018	193,775	14,901		591,694
Disability	427,149	108,837	8,196		544,182
Termination	460,790	481,206	40,635		982,631
Total Active	$16,783,379	$19,795,825	$1,426,870		$38,006,074
Vested Terminated (a)	745,544	625,000	85,000		1,455,544
Non-Vested Terminated	230,252	0	0		230,252
Retirees and Survivors	20,557,544	28,772,678	2,405,606	146,300	51,882,128
Total Actuarial Liability	$38,316,719	$49,193,503	$3,917,476	$146,300	$91,573,998
E. Actuarial Value of Assets	24,773,042	25,638,136	1,541,028	0	51,952,206
F. Unfunded Actuarial Liability	$13,543,677	$23,555,367	$2,376,448	$146,300	$39,621,792
G. Funded Ratio: E/D	64.7%	52.1%	39.3%	0.0%	56.7%

(a) Massachusetts Teachers' and Boston teachers' amounts are estimated and includes non-vested terminated members.

4. DEVELOPMENT OF THE ACTUARIAL GAIN OR LOSS *(in millions)*

		State	Mass. Teachers	Boston Teachers	Local COLA	Total
A.	Gain/(loss) on Actuarial Liability					
1.	Actuarial Liability 1/1/16	36,966	46,563	3,711	161	87,401
2.	Total Normal Cost 1/1/16	845	875	75		1,795
3.	Interest on (1) and (2) at 7.50%	2,836	3,558	284	12	6,690
4.	Benefits paid during 2016 [a]	2,050	2,800	235	24	5,109
5.	Interest on (4) assuming mid year payment	77	105	9	1	192
6.	Expected Actuarial Liability before adjustments: (1)+(2)+(3)-(4)-(5)	38,520	48,091	3,826	148	90,585
7.	Increase due to changes in assumptions	304	1,176	94		1,574
8.	Increase due to plan amendment, toll collectors ERI	10				10
9.	Expected Actuarial Liability 1/1/17: (6)+(7)+(8)	38,834	49,267	3,920	148	92,169
10.	Actuarial Liability 1/1/17	38,317	49,194	3,917	146	91,574
11.	Gain/(loss): (9)-(10)	517	73	3	2	595
B.	Gain/(loss) on assets					
12.	Actuarial Value of Assets (AVA) 1/1/16	23,465	24,594	1,476		49,535
13.	Interest on (13) at 7.50%	1,760	1,845	111		3,715
14.	Net Receipts [b]	892	759	132		1,783
15.	Net Disbursements [b]	1,560	1,784	189		3,533
16.	Net Cash Flow: (14)-(15)	(668)	(1,025)	(57)		(1,750)
17.	Interest on (16) [c]	(25)	(38)	(7)		(71)
18.	Expected AVA 1/1/17: (12)+(13)+(16)+(17)	24,532	25,375	1,523		51,430
19.	AVA 1/1/17	24,773	25,638	1,541		51,952
20.	Gain/(loss): (19)-(18)	241	263	18		522
C.	Total Gain/(loss): (11)+(20)	758	336	22	2	1,118

Figures may not add due to rounding.

[a] Estimated

[b] Amounts actually received or disbursed by the fund.

[c] Assumes time weighting based on monthly cash flow. Boston Teachers assumed mid-year.

5. AUDIT INFORMATION

The Commonwealth valuation reports prior to 2015 included information required under Governmental Accounting Standards Board (GASB) Statement No. 27 (GASB 27). The Commonwealth began implementing GASB 27 in Fiscal Year 1996. GASB 27 has been replaced by GASB 68. In addition, GASB 67 replaces the requirements under GASB 25.

GASB 67 reflects plan financial statement reporting and was first effective for the plan year ending June 30, 2014. GASB 68 reflects employer financial statement reporting and was first effective for the fiscal year ending June 30, 2015.

We have not provided any GASB 67 or GASB 68 exhibits in this valuation report. These exhibits are provided under separate cover.

6. ASSETS

PART A | STATE AND MASSACHUSETTS TEACHERS'

(Dollars in thousands)

	State	Mass. Teachers
Pension Reserves Investment Trust		
Market Value	$24,366,420	$25,225,451
Actuarial Value	$24,773,042	$25,638,136
Actuarial Value as a Percentage of Market Value	101.7%	101.6%

The Market Value of Assets for the State includes $168.3 million for former members of the Massachusetts Turnpike Authority Employees' Retirement System.

The actuarial value of assets (AVA) is determined so that 20% of the investment gain and loss in a given year is recognized annually for the next 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 actuarial value of assets can never be too far from the market value of assets. Under our approach for the Commonwealth, the actuarial value cannot be less than 90% nor greater than 110% of the market value.

PART B | BOSTON TEACHERS

Based on the enactment of Chapter 112 of the Acts of 2010, the assets of the Boston Teachers are maintained by PRIM. The transfer of these assets occurred during 2010. We set the actuarial value of assets to 101.7% of the market value based on the results for State and Massachusetts Teachers.

Market Value	$1,515,268
Actuarial Value	$1,541,028

6. ASSETS *(continued)*

PART C | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

(Dollars in thousands)

A. Development of 12/31/16 expected actuarial value of assets (AVA)	State	Mass. Teachers	Total
1. Market Value (MV) 12/31/15	23,1765,451	24,308,553	47,485,004
2. Actuarial Value 12/31/15 (as calculated)	23,465,963	24,593,787	48,059,750
3. Net Receipts 2016	891,962	758,703	1,650,665
4. Net Disbursements 2016	1,559,110	1,784,261	3,343,371
5. Net Cash Flow: (3)-(4)	(667,148)	(1,025,558)	(1,692,706)
6. Expected Investment Return on (2): 0.0750 x (2)	1,759,947	1,844,534	3,604,481
7. Expected Investment Return on (5): ½x 0.0750 x (5)	(25,018)	(38,458)	(63,476)
8. Expected AVA 12/31/16: (2)+(5)+(6)+(7)	24,533,744	25,374,305	49,908,049
B. Previous differences not yet amortized			
1. Unrecognized amount of 12/31/15 difference			
a. .2 x 2012 Gain/(loss)	173,289	186,661	359,950
b. .4 x 2013 Gain/(loss)	597,467	637,773	1,235,240
c. .6 x 2014 Gain/(loss)	94,863	101,093	195,956
d. .8 x 2015 Gain/(loss)	(1,155,131)	(1,210,762)	(2,365,893)
e. Total	(289,512)	(285,234)	(574,747)
C. Gain/(loss) from 2016			
1. Market Value 12/31/16	24,366,420	25,225,451	49,591,871
2. Expected Market Value 12/31/16: A(8)+B(1e)	24,244,232	25,089,070	49,333,302
3. Gain/ (loss) from 2016 investment: (1)-(2)	122,188	136,381	258,569
D. Development of AVA 12/31/16			
1. 2016 Gain/(loss)	122,188	136,381	258,569
2. 2015 Gain/(loss)	(1,443,914)	(1,513,452)	(2,957,366)
3. 2014 Gain/(loss)	158,105	168,488	326,593
4. 2013 Gain/(loss)	1,493,668	1,594,433	3,088,101
5. 2012 Gain/(loss)	866,444	933,306	1,799,750
6. 20% of 2016 Gain/(loss)	24,438	27,276	51,714
7. 20% of 2015 Gain/(loss)	(288,783)	(302,690)	(591,473)
8. 20% of 2014 Gain/(loss)	31,621	33,698	65,319
9. 20% of 2013 Gain/(loss)	298,734	318,887	617,620
10. 20% of 2012 Gain/(loss)	173,289	186,661	359,950
11. Total	239,298	263,831	503,129
12. Actuarial Value 12/31/16: A(8)+D(11)	24,773,042	25,638,136	50,411,178
13. Percentage of Market Value	101.7%	101.6%	101.7%
14. Actuarial Value: (12) but not less than 90% or greater than 110% of C(1)	24,773,042	25,638,136	50,411,178

7. SYSTEM MEMBERSHIP

PART A | STATE ACTIVE MEMBERS

A critical element of an actuarial valuation is accurate and up-to-date membership information. As part of this valuation, PERAC analyzed the member data provided by the State Retirement System.

	Actives	Vested Terminations
Number of Members	90,014	4,094
Average Age	46.9	53.7
Average Service	12.4	15.4
Average Salary	$65,845	$58,010
Average Annuity Savings Fund Balance	$62,643	$64,284

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	2,305	7						2,312
25 - 29	6,858	798	14					7,670
30 - 34	5,677	2,978	891	12				9,558
35 - 39	3,816	2,367	2,309	636	8			9,136
40 - 44	2,743	1,846	1,964	2,220	523	16		9,312
45 - 49	2,758	1,878	2,063	2,456	2,037	907	51	12,150
50 - 54	2,383	1,725	1,896	2,004	1,851	2,169	1,156	13,184
55 - 59	1,935	1,507	1,726	1,861	1,549	1,854	2,504	12,936
60 - 64	1,079	1,056	1,274	1,462	1,148	1,096	1,817	8,932
65+	433	617	671	713	607	532	1,251	4,824
Total	29,987	14,779	12,808	11,364	7,723	6,574	6,779	90,014

7. SYSTEM MEMBERSHIP *(continued)*

PART A | STATE ACTIVE MEMBERS *(continued)*

Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	2,312	$79,785,863	$34,509
25 - 29	7,670	$354,593,919	$46,231
30 - 34	9,558	$526,548,023	$55,090
35 - 39	9,136	$561,789,609	$61,492
40 - 44	9,312	$618,937,842	$66,467
45 - 49	12,150	$853,017,369	$70,207
50 - 54	13,184	$941,578,512	$71,418
55 - 59	12,936	$940,071,458	$72,671
60 - 64	8,932	$675,991,808	$75,682
65+	4,824	$374,697,410	$77,674
Total	90,014	$5,927,011,814	$65,845

7. SYSTEM MEMBERSHIP *(continued)*

PART B | STATE RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	51,844	636	3,305	6,474	62,259
Average Age	71.9	64.7	64.3	75.2	71.7
Average Annual Benefit	$35,343	$20,063	$40,181	$18,385	$33,680

Benefit by Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	$355,001,510	$2,098,760	$10,348,046	$18,587,668	$386,035,984
Pension	$1,477,309,307	$10,661,163	$122,448,654	$100,435,668	$1,710,854,792
Total	$1,832,310,817	$12,759,923	$132,796,700	$119,023,336	$2,096,890,776

7. SYSTEM MEMBERSHIP *(continued)*

PART B | STATE RETIREES & SURVIVORS *(continued)*

Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	137	$3,508,527	$25,610
40 – 44	160	$5,126,949	$32,043
45 – 49	821	$28,855,796	$35,147
50 – 54	1,649	$58,087,566	$35,226
55 – 59	4,221	$147,392,196	$34,919
60 – 64	8,692	$330,964,287	$38,077
65 – 69	13,438	$512,496,199	$38,138
70 – 74	11,778	$417,060,150	$35,410
75 – 79	7,786	$250,751,978	$32,205
80 – 84	6,026	$172,687,801	$28,657
85 – 89	4,369	$106,574,809	$24,393
90+	3,182	$63,384,520	$19,920
Totals	62,259	$2,096,890,776	$33,680

7. SYSTEM MEMBERSHIP *(continued)*

PART C | MASSACHUSETTS TEACHERS' ACTIVE MEMBERS

A critical element of an actuarial valuation is accurate and up-to-date membership information. As part of this valuation, PERAC analyzed the member data provided by the TRS. We made several assumptions about missing, questionable, or unavailable data.

Until the January 1, 2006 actuarial valuation, we had estimated the total creditable service for each member for the actuarial valuation. The estimate was based on either the employment date (date of hire as a teacher) or the adjusted employment date and was set equal to the greater of the two calculated service amounts. We used this methodology, which we believed was conservative, because we had no way to assess additional costs for members who buy back service near retirement. In 2006, we compared the service estimated for valuation purposes with actual service for over 6,800 members who retired in 2004 and 2005. We found that, in total, our methodology slightly understated service. To estimate this additional cost, we increased the plan liabilities as of January 1, 2006. We have continued using this methodology in each valuation.

For members with a date of birth and/or date of hire that seemed questionable, we assumed (based on credited service or date of birth) the member was hired at age 30 (or at a younger age, if the member was under 30).

Based on our experience with prior years' data, buyback issues, and questions to TRS regarding specific members, we made several adjustments. Members whose pay was less than $5,000 were assumed to be inactive. For members with pay between $5,000 and $10,000, we used an estimated pay of $50,000. For members with submitted pay over $150,000, we compared this year's figure to the pay used in last year's valuation. We adjusted this year's figure based on the amount contributed if we believed it was overstated.

Determining valuation pay for members with reported pay less than $10,000 is difficult. Although we make the assumptions outlined above, we know there will always be a significant number of members that fall into this category for a variety of reasons including leaves of absence and part time employment. We believe our overall assumption is reasonable but know some members that we have deemed inactive are active members. To reflect this uncertainty, we made an additional increase to the calculated plan liabilities consistent with last year.

We increased the normal cost by 2.0% and the active actuarial liability by 1.0% to reflect the service buyback and various data issues.

Pay for all members hired in 2016 was annualized.

Because we could not determine the number of vested terminations, we estimated a combined inactive (terminated vested plus terminated with an ASF balance) liability. This is the same methodology we have used in prior valuations.

7. SYSTEM MEMBERSHIP *(continued)*

PART C | MASSACHUSETTS TEACHERS' ACTIVE MEMBERS *(continued)*

	Actives
Number of Members	92,128
Average Age	43.6
Average Service	13.0
Average Salary	$71,464
Average Annuity Savings Fund Balance	$71,626

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	2,250	2						2,252
25 - 29	8,407	1,555						9,962
30 - 34	4,591	6,250	2,040					12,881
35 - 39	2,211	2,914	6,180	1,832	15			13,152
40 - 44	1,556	1,494	2,759	5,410	938	15		12,172
45 - 49	1,433	1,492	2,036	3,872	3,903	507	25	13,268
50 - 54	906	1,249	1,791	2,285	1,862	1,769	667	10,529
55 - 59	512	688	1,555	2,202	1,508	1,160	2,102	9,727
60 - 64	196	339	767	1,421	1,136	758	1,721	6,338
65+	57	127	220	336	297	181	629	1,847
Total	22,119	16,110	17,348	17,358	9,659	4,390	5,144	92,128

7. SYSTEM MEMBERSHIP *(continued)*

PART C | MASSACHUSETTS TEACHERS' ACTIVE MEMBERS *(continued)*

Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	2,252	$100,746,140	$44,736
25 - 29	9,962	$512,788,115	$51,474
30 - 34	12,881	$788,947,253	$61,249
35 - 39	13,152	$942,971,179	$71,698
40 - 44	12,172	$929,435,231	$76,358
45 - 49	13,268	$1,028,754,198	$77,536
50 - 54	10,529	$824,387,275	$78,297
55 - 59	9,727	$783,131,433	$80,511
60 - 64	6,338	$519,284,708	$81,932
65+	1,847	$153,425,944	$83,068
Total	92,128	$6,583,871,474	$71,464

7. SYSTEM MEMBERSHIP *(continued)*

PART D | MASSACHUSETTS TEACHERS' RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	60,621	400	309	3,706	65,036
Average Age	72.1	67.8	71.2	78.1	72.4
Average Annual Benefit	$45,245	$22,239	$41,171	$19,943	$43,642

Benefit by Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	$524,870,732	$1,597,364	$1,098,687	$13,053,525	$540,620,308
Pension	$2,217,899,649	$7,298,095	$11,623,298	$60,857,038	$2,297,678,080
Total	$2,742,770,381	$8,895,459	$12,721,985	$73,910,563	$2,838,298,388

7. SYSTEM MEMBERSHIP *(continued)*

PART D | MASSACHUSETTS TEACHERS' RETIREES & SURVIVORS *(continued)*

Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	29	$328,315	$11,321
40 – 44	48	$572,958	$11,937
45 – 49	72	$972,789	$13,511
50 – 54	191	$4,214,530	$22,066
55 – 59	1,560	$58,957,567	$37,793
60 – 64	8,888	$439,512,903	$49,450
65 – 69	19,666	$975,003,514	$49,578
70 – 74	14,729	$679,087,107	$46,105
75 – 79	8,107	$326,278,341	$40,246
80 – 84	5,378	$188,098,943	$34,976
85 – 89	3,787	$109,957,915	$29,036
90+	2,581	$55,313,505	$21,431
Totals	65,036	$2,838,298,387	$43,642

7. SYSTEM MEMBERSHIP *(continued)*

PART E | BOSTON TEACHERS' ACTIVE MEMBERS

A critical element of an actuarial valuation is accurate and up-to-date membership information. As part of this valuation, PERAC analyzed the member data provided by the Boston Retirement System.

	Actives
Number of Members	6,479
Average Age	42.4
Average Service	11.4
Average Salary	$84,708
Average Annuity Savings Fund Balance	$79,822

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	163							163
25 - 29	733	69						802
30 - 34	549	410	110	1				1,070
35 - 39	234	330	404	90				1,058
40 - 44	139	139	257	272	50	4		861
45 - 49	126	91	138	194	188	52	14	803
50 - 54	73	52	92	118	91	128	46	600
55 - 59	55	47	83	98	86	107	123	599
60 - 64	21	23	44	79	80	56	75	378
65+	8	15	16	32	22	18	34	145
Total	2,101	1,176	1,144	884	517	365	292	6,479

7. SYSTEM MEMBERSHIP *(continued)*

PART E | BOSTON TEACHERS' ACTIVE MEMBERS *(continued)*

Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	163	$8,263,623	$50,697
25 - 29	802	$50,681,741	$63,194
30 - 34	1,070	$82,708,135	$77,297
35 - 39	1,058	$92,450,765	$87,383
40 - 44	861	$78,300,311	$90,941
45 - 49	803	$73,599,116	$91,655
50 - 54	600	$56,168,122	$93,614
55 - 59	599	$56,043,340	$93,562
60 - 64	378	$36,931,530	$97,702
65+	145	$13,679,300	$94,340
Total	6,479	$548,825,983	$84,708

7. SYSTEM MEMBERSHIP *(continued)*

PART F | BOSTON TEACHERS' RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	4,263	46	74	305	4,688
Average Age	72.3	67.8	72.2	74.7	72.4
Average Annual Benefit	$53,461	$24,637	$46,360	$22,855	$51,075

Benefit by Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	$44,617,684	$229,399	$339,777	$1,253,905	$46,440,765
Pension	$183,287,764	$903,918	$3,090,872	$5,716,759	$192,999,313
Total	$227,905,448	$1,133,317	$3,430,649	$6,970,664	$239,440,078

7. SYSTEM MEMBERSHIP *(continued)*

PART F | BOSTON TEACHERS' RETIREES & SURVIVORS *(continued)*

Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	6	$170,734	$28,456
40 - 44	2	$47,986	$23,993
45 - 49	3	$61,669	$20,556
50 - 54	29	$694,714	$23,956
55 - 59	119	$5,604,636	$47,098
60 - 64	613	$35,770,792	$58,354
65 - 69	1,356	$79,452,232	$58,593
70 - 74	1,103	$58,982,324	$53,474
75 - 79	631	$29,193,865	$46,266
80 - 84	362	$14,388,157	$39,746
85 - 89	284	$9,855,500	$34,702
90+	180	$5,217,472	$28,986
Totals	4,688	$239,440,078	$51,075

8. VALUATION COST METHODS

PART 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 retirement system member, 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 inactives, retirees, and survivors is simply equal to the present value of all projected benefits. 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 be changed by the addition of new members or the retirement, death, disability, 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 change.

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 an *Actuarial Loss* and one which decreases the Unfunded Actuarial Liability is called an *Actuarial Gain*.

PART B | ASSET VALUATION METHOD

In valuations prior to 1998, plan assets were determined at market value. As part of the 1998 valuation this methodology was adjusted so that investment gains and losses for a given year would not be fully recognized until five years have passed. This calculation recognizes 20% of the gain or loss occurring in the prior year, 40% of those gains or losses occurring two years ago, etc., so that 100% of the gain or loss occurring 5 or more years ago is recognized. This approach reduces the potential volatility in the market value approach from year to year. Under our corridor approach, the actuarial value of assets cannot be less than 90% nor greater than 110% of market value. The actuarial value of assets as of January 1, 2017 is 101.7% of the market value.

9. ACTUARIAL ASSUMPTIONS

Investment Return

7.50% per year net of investment expenses

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

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

State: Pre-retirement mortality reflects RP-2014 Blue Collar Employees table projected generationally with Scale MP-2016 set forward 1 year for females. (*Prior assumption: RP-2000 Employees table projected generationally with Scale BB and a base year of 2009 (gender distinct)*).

Teachers: Pre-retirement mortality reflects RP-2014 White Collar Employees table projected generationally with Scale MP-2016 (gender distinct). *(Prior assumption: RP-2014 Employees table projected generationally with Scale BB).*

State: Post-retirement mortality reflects RP-2014 Blue Collar Healthy Annuitant table projected generationally with Scale MP-2016 set forward 1 year for females *(Prior assumption: RP-2000 Healthy Annuitant table projected generationally with Scale BB and a base year of 2009 (gender distinct)*).

Teachers: Post-retirement mortality reflects RP-2014 White Collar Healthy Annuitant table projected generationally with Scale MP-2016 (gender distinct). *(Prior assumption: RP-2014 Employees table projected generationally with Scale BB).*

State: For disabled members, the mortality rate is assumed to be in accordance with the RP-2000 Healthy Annuitant Table projected generationally with Scale BB and a base year of 2015 (gender distinct).

Teachers: For disabled members, the mortality rate is assumed to be in accordance with the RP-2014 Healthy Annuitant Table projected generationally with Scale BB and a base year of 2014 set forward 4 years.

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 post-retirement mortality through January 1, 2017 and professional judgment. This assumption reflects observed current mortality as well as expected mortality improvement. The disabled member assumption does not reflect the most recent work. This assumption will be reviewed before the next valuation.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Salary Increase

Based on an analysis of past experience. Annual rates are based on service as shown below.

Service	Groups 1& 2	Group 3	Group 4	Service	Teachers
0	7.00%	7.00%	9.00%	0	7.50%
1	6.50%	7.00%	8.00%	1	7.10%
2	6.00%	7.00%	7.50%	2	7.00%
3	5.50%	7.00%	7.00%	3	6.90%
4	5.50%	6.75%	6.75%	4	6.80%
5	5.25%	6.25%	6.25%	5	6.70%
6	5.00%	5.25%	5.75%	6	6.60%
7	4.75%	4.75%	5.25%	7	6.50%
8-12	4.75%	4.75%	4.75%	8	6.30%
13-15	4.50%	4.75%	4.75%	9	6.10%
16-19	4.25%	4.75%	4.75%	10	5.90%
20+	4.00%	4.50%	4.50%	11	5.70%
				12	5.20%
				13	4.70%
				14	4.35%
				15-16	4.20%
				17-19	4.10%
				20+	4.00%

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

9. ACTUARIAL ASSUMPTIONS *(continued)*

Retirement

	Group 1		Group 2	Group 3	Group 4
Age	Male	Female			
45	0.000	0.000	0.000	0.020	0.060
46	0.000	0.000	0.000	0.020	0.060
47	0.000	0.000	0.000	0.050	0.060
48	0.000	0.000	0.000	0.050	0.060
49	0.000	0.000	0.000	0.050	0.060
50	0.030	0.030	0.020	0.050	0.060
51	0.030	0.030	0.020	0.060	0.060
52	0.030	0.030	0.020	0.070	0.060
53	0.030	0.030	0.030	0.080	0.075
54	0.030	0.035	0.040	0.090	0.150
55	0.035	0.050	0.075	0.100	0.250
56	0.035	0.050	0.075	0.100	0.150
57	0.040	0.055	0.080	0.110	0.150
58	0.050	0.060	0.100	0.110	0.150
59	0.060	0.065	0.120	0.120	0.150
60	0.090	0.075	0.150	0.140	0.200
61	0.110	0.100	0.150	0.150	0.200
62	0.150	0.150	0.150	0.150	0.200
63	0.150	0.150	0.150	0.150	0.200
64	0.160	0.150	0.200	0.250	0.300
65	0.200	0.200	0.200	0.250	0.500
66	0.200	0.200	0.200	0.250	0.250
67	0.200	0.200	0.200	0.250	0.250
68	0.200	0.200	0.200	0.250	0.250
69	0.200	0.200	0.200	0.250	0.250
70	1.000	1.000	1.000	1.000	1.000

9. ACTUARIAL ASSUMPTIONS *(continued)*

Teachers

Males

	Not in Retirement Plus	
	Less than 20	20+
47	0.000	0.000
48	0.000	0.000
49	0.000	0.000
50	0.000	0.020
51	0.000	0.020
52	0.000	0.020
53	0.000	0.020
54	0.000	0.030
55	0.035	0.030
56	0.035	0.035
57	0.050	0.040
58	0.055	0.050
59	0.060	0.060
60	0.075	0.150
61	0.120	0.250
62	0.140	0.300
63	0.140	0.300
64	0.140	0.300
65	0.300	0.300
66	0.300	0.250
67	0.300	0.250
68	0.300	0.250
69	0.300	0.250
70+	1.000	1.000

	Retirement Plus		
	Less than 20	20-30	30+
47	0.00	0.000	0.00
48	0.00	0.000	0.00
49	0.00	0.000	0.00
50	0.00	0.010	0.02
51	0.00	0.010	0.02
52	0.00	0.010	0.02
53	0.00	0.015	0.02
54	0.00	0.025	0.02
55	0.05	0.030	0.06
56	0.05	0.060	0.20
57	0.05	0.100	0.40
58	0.05	0.150	0.50
59	0.10	0.200	0.50
60	0.10	0.250	0.40
61	0.20	0.300	0.40
62	0.20	0.350	0.35
63	0.25	0.400	0.35
64	0.25	0.400	0.35
65	0.25	0.400	0.35
66	0.30	0.300	0.40
67	0.30	0.300	0.40
68	0.30	0.300	0.40
69	0.30	0.300	0.40
70+	1.00	1.000	1.00

9. ACTUARIAL ASSUMPTIONS *(continued)*

Teachers

Females

	Not in Retirement Plus	
	Less than 20	20+
47	0.000	0.000
48	0.000	0.000
49	0.000	0.000
50	0.000	0.010
51	0.000	0.010
52	0.000	0.015
53	0.000	0.020
54	0.000	0.020
55	0.035	0.040
56	0.035	0.040
57	0.035	0.040
58	0.050	0.060
59	0.065	0.080
60	0.085	0.150
61	0.100	0.200
62	0.120	0.200
63	0.120	0.250
64	0.200	0.300
65	0.300	0.400
66	0.300	0.300
67	0.300	0.300
68	0.300	0.300
69	0.300	0.300
70+	1.000	1.000

	Retirement Plus		
	Less than 20	20-30	30+
47	0.00	0.00	0.000
48	0.00	0.00	0.000
49	0.00	0.00	0.000
50	0.00	0.01	0.015
51	0.00	0.01	0.015
52	0.00	0.01	0.015
53	0.00	0.01	0.015
54	0.00	0.01	0.020
55	0.03	0.03	0.050
56	0.03	0.05	0.150
57	0.04	0.08	0.350
58	0.08	0.10	0.350
59	0.08	0.15	0.350
60	0.10	0.20	0.350
61	0.12	0.25	0.350
62	0.12	0.30	0.350
63	0.15	0.30	0.350
64	0.20	0.30	0.350
65	0.25	0.40	0.350
66	0.25	0.30	0.350
67	0.30	0.30	0.300
68	0.30	0.30	0.300
69	0.30	0.30	0.300
70+	1.00	1.00	1.000

Retirement rates are based on our most recent experience analysis (2014) which reviewed age, service, gender, and job group. The assumption reflects this analysis and professional judgment.

9. ACTUARIAL ASSUMPTIONS *(continued)*

Disability

Based on an analysis of past experience. Sample annual rates are shown below.

Age	Group 1	Group 2	Group 3	Group 4	Teachers
20	0.00010	0.00052	0.0010	0.0020	0.00004
30	0.00010	0.00072	0.0016	0.0021	0.00006
40	0.00068	0.00210	0.0036	0.0071	0.00010
50	0.00133	0.00420	0.0094	0.0110	0.00050
60	0.00120	0.00500	0.0430	0.0080	0.00070

It is also assumed that 75% of disabilities will be job-related for Group 1 and 2 members (other than Teachers), and 95% will be job-related for Group 3 and 4 members, and 35% will be job-related for Teachers.

Disability rates are based on our most recent experience analysis (2014) which reviewed age, gender and job group. The assumption reflects this analysis and professional judgment.

Withdrawal

Rates are based on an analysis of past experience and professional judgment. For Groups 1 and 2, rates are both age and service based for service up to 10 years. After 10 years of service, rates are age based. In addition to being age and service based, Teacher rates are also gender based. For Groups 3 and 4, rates are service based. Sample annual rates are shown below.

Groups 1 & 2

Age	Service		
	0	5	10+
20	0.270	0.000	0.000
30	0.230	0.100	0.045
40	0.160	0.080	0.030
50	0.180	0.060	0.030

Groups 3 & 4

Service	Group 3	Group 4
0	0.007	0.090
5	0.007	0.060
10	0.005	0.035
15	0.005	0.020
20+	0.005	0.015

9. ACTUARIAL ASSUMPTIONS *(continued)*

Teachers

Age	Service					
	0		5		10+	
	Male	Female	Male	Female	Male	Female
20	0.130	0.100	0.055	0.070	0.015	0.050
30	0.150	0.150	0.054	0.088	0.015	0.045
40	0.133	0.105	0.052	0.050	0.017	0.022
50	0.162	0.098	0.070	0.050	0.023	0.020

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.

Family Composition

It is assumed that 80% of plan participants are married and that the male spouse in 3 years older than the female spouse.

Loading and Administrative Expenses

State

We increased the normal cost by 2% and the actuarial accrued liability of active members by $250 million 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 Sections10, 28M, 28N, 65D, and 100. An amount of $55.2 million has been included with the normal cost to reflect administrative expenses paid by the fund, net 3(8)(c) disbursements, and transfers from the SRS plan assets to the ORP.

Teachers

We increased the total normal cost by 2% and the actuarial accrued liability of active members by 1% to account for buybacks at retirement and various data issues including the status of members with reported pay of less than $10,000. In addition, an amount of $28.5 million has been included in the normal cost to reflect a portion of administrative and other expenses paid by the fund and net Section 3(8)(c) cash flow.

Boston Teachers

We increased the total normal cost by 2% and the actuarial accrued liability of active members by 1%. In addition, an amount of $7.0 million has been included in the normal cost to reflect a portion of administrative and other expenses paid by the fund.

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 in the Commonwealth. Members of the Massachusetts Teachers' Retirement System and Boston teachers are classified in Group 1.

Group 1:

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

Group 2:

Certain specified hazardous duty positions.

Group 3:

Officers and inspectors of the Department of State Police.

Group 4:

Police Officers, firefighters, corrections officers, and other specified hazardous positions.

MEMBER CONTRIBUTIONS

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

Date of Membership	Contribution Rate
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
7/1/96 to present:	12% of regular compensation (State Police)
7/1/01 to present:	11% of regular compensation (for teachers hired after 7/1/01 and those accepting provisions of Chapter 114 of the Acts of 2000)
1979 to present:	an additional 2% of regular compensation in excess of $30,000 except for teachers subject to Chapter 114 of the Acts of 2000.

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 at 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

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

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 hired prior to 1978, or if classified in Group 4.

AMOUNT OF 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 or her 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.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

• Salary is defined as gross regular compensation. For employees 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 three consecutive years that produce the highest average, or, if greater, during the last three years (whether or not consecutive) preceding retirement.

• 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 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 Group 4 employees who retire at or after age 55. A .125% reduction is applied for each year of age under the maximum age for the member's group.

• For a teacher who is subject to the provisions of Chapter 114 of the Acts of 2000 and who has completed at least 30 years of creditable service, the benefit rate is multiplied by the creditable service and the resulting percentage is increased by 2% per year for each year of service in excess of 24. The amount determined cannot exceed 80% of the average salary.

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.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

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. Group 4 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 70½.

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.

DISABILITY RETIREMENT

The Massachusetts Retirement Plan provides two 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 ten years of creditable service.

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.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

ACCIDENTAL DISABILITY

Eligibility: Applies to members who become permanently incapacitated from 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. However, 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 $871.56 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. 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.

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 $871.56 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 resulting 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 of a firefighter, public prosecutor, police officer or corrections officer killed in the line of duty may receive a one-time payment of $150,000 from the State Retirement Board.

10. SUMMARY OF PLAN PROVISIONS *(continued)*

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

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 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 superannuation retirement age, the age 60 benefit rate is used. If the member died after age 60, the actual age is used. 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 $9,000, 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.

COST OF LIVING

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

10. SUMMARY OF PLAN PROVISIONS *(continued)*

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 remains unmarried 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 predeceases the retiree, the benefit payable increases (or "pops up") 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 predeceases the retiree, the benefit payable "pops up" 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, rather than 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 reduce the Unfunded Accrued Liability.

11. GLOSSARY OF TERMS *(continued)*

ANNUAL STATEMENT

The statement submitted to PERAC each year that describes the asset holdings and Fund balances as of December 31 as well as 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, are 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 and inactive members.

ASSETS

The value of securities held by the plan.

COST OF BENEFITS

The estimated payment from the pension system for benefits for the fiscal year.

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 22C of M.G.L. Chapter 32.

GASB

Governmental Accounting Standards Board

11. GLOSSARY OF TERMS *(continued)*

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.

PENSION FUND

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

PENSION RESERVE FUND

The fund that 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.

SPECIAL FUND FOR MILITARY SERVICE CREDIT

The fund which is credited with an amount 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 ACCRUED LIABILITY

The excess of the Actuarial Accrued Liability over the Assets.

PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION
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