

# Commonwealth

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## ACTUARIAL VALUATION REPORT

JANUARY 1, 2004





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# I. INTRODUCTION & CERTIFICATION

This report presents the results of the actuarial valuation of the pension benefits that are the obligation of the Commonwealth of Massachusetts as follows:

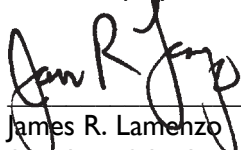
- State Employees Retirement System
- Massachusetts Teachers' Retirement System
- Boston Teachers
- Cost of Living Allowances to Local Systems

The valuation was performed as of January 1, 2004 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 accrued liability and the normal cost are the same as the assumptions we used in our January 1, 2003 actuarial valuation and reflect the experience analysis we conducted in 2000.

This valuation is based on member data as of December 31, 2003, which was supplied by the Boston, State, and State Teachers' Retirement Boards. We performed a number of tests on the data to ensure reasonableness and made specific assumptions for a number of State Teacher data items. Asset information as of December 31, 2003 was provided by the Pension Reserves Investment Management Board and by the Boston Retirement Board in its Annual Statement of Financial Condition. We reviewed both the membership data and financial information for reasonableness but we did not audit this information.

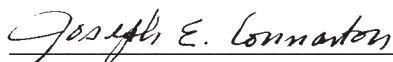
We believe this report represents an accurate appraisal of the actuarial status of the Commonwealth's total pension obligation performed in accordance with generally accepted actuarial principles and practices relating to pension plans. In our opinion, the actuarial assumptions used in this report are reasonable, are related to plan experience and expectations, and represent our best estimate of anticipated experience.

Respectfully submitted,  
Public Employee Retirement Administration Commission



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James R. Lamenza  
Member of the American Academy of Actuaries  
Associate of the Society of Actuaries  
Enrolled Actuary Number 02-4709



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Joseph E. Connarton  
Executive Director

Dated: July 2, 2004

## 2. EXECUTIVE SUMMARY

### PART A | PRINCIPAL VALUATION RESULTS

Section 22C of G.L. c. 32 mandates the establishment of a funding schedule for the Commonwealth of Massachusetts pension obligation. The schedule, as mandated by law, calls for payment of the Normal Cost plus an amortization payment on the Unfunded Actuarial Liability. The provisions of Chapter 32, Section 22C require amortization payments such that the Unfunded Actuarial Liability is reduced to 0 by June 30, 2023. Under the current schedule, the amortization payments to eliminate the initial unfunded liability increase by 4.5% per year.

The results of the January 1, 2004 actuarial valuation are as follows (000s omitted):

Total Normal Cost	\$1,026,624
Expected Employee Contributions	<u>778,284</u>
Net Normal Cost	<u>\$248,340</u>

Total Actuarial Liability	\$46,059,209
Assets	<u>34,045,177</u>
Unfunded Actuarial Liability	<u>\$12,014,032</u>

## 2. EXECUTIVE SUMMARY *(continued)*

### PART B | COMPARISON WITH PRIOR VALUATION AND EXPERIENCE ANALYSIS

A comparison of the current valuation and the January 1, 2003 valuation is shown below.  
(\$000's omitted)

	1/1/04	1/1/03	Increase (Decrease)	Increase (Decrease)
Total Normal Cost	\$1,026,624	\$1,010,080	\$16,544	1.6%
Expected Employee Contributions	<u>778,284</u>	<u>753,249</u>	<u>25,035</u>	3.3%
Net Normal Cost	<u>\$248,340</u>	<u>\$256,831</u>	<u>(\$8,491)</u>	(3.3%)
Actuarial Liability				
Actives	\$24,478,858	\$24,160,086	\$318,772	1.3%
Retirees and Inactives	<u>21,580,351</u>	<u>18,870,252</u>	<u>2,710,099</u>	14.4%
Total	\$46,059,209	\$43,030,338	\$3,028,871	7.0%
Assets	<u>34,045,177</u>	<u>29,628,896</u>	<u>4,416,281</u>	14.9%
Unfunded Actuarial Liability	<u>\$12,014,032</u>	<u>\$13,401,442</u>	<u>(\$1,387,410)</u>	(10.4)%
Funded Ratio	73.9%	68.9%	5.0%	

The January 1, 2004 valuation results reflect the fourth year of the revised actuarial assumptions determined as part of our Experience Study Analysis reports we completed for the State Retirement System and State Teachers' Retirement System in 2000.

The development of the actuarial gain/(loss) is shown on page 9. During 2003, there was an overall actuarial gain of \$2.2 billion. There was a non-investment loss on actuarial liability of approximately \$300 million and a gain on assets (on an actuarial value basis) of \$2.5 billion. The return on assets was approximately 17.8% on an actuarial value basis, compared to 26.4% on a market value basis.

## 2. EXECUTIVE SUMMARY *(continued)*

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

The development of the actuarial value of assets for the State and State Teachers' systems is shown on page 13. As of January 1, 2004, the actuarial value of assets is 107.4% of the market value. Under the corridor approach used in this valuation, the actuarial value of assets cannot be less than 85% nor greater than 115% of the market value. The January 1, 2004 actuarial value of assets is within this corridor. As of January 1, 2003 the calculated actuarial value was greater than 115% of market value, so the corridor was imposed. For a comparison of the market and actuarial value of assets since 1997 see page 7.

In 2003, the State Retirement System implemented an Early Retirement Incentive Program (ERIP). Approximately 3,100 members retired under the program. The compensation for the members who retired under the program was approximately \$163 million. The increase in actuarial accrued liability due to the ERIP was approximately \$228 million on December 31, 2003. The normal cost for the State was approximately \$6.4 million for those members prior to retirement. Through FY05, there is a limit on the amount of payroll allowable for members who are hired to replace those who retired under the ERIP. This limit is 20% of actual pay had the retiring members remained in service.

We have detailed a number of the assumptions we made for missing or questionable data for active members of the Teachers' Retirement System in Section 7. We believe our data assumptions are conservative based on our detailed review and comparison of information provided to us. We believe the assumptions we have made provide reasonable valuation results on an overall basis for the Commonwealth and likely overstate the plan liabilities for the Teachers' System. We noted that the active member salary data submitted for this valuation has significantly improved from prior years' submissions.

As in past valuations, the assets allocated to Boston teachers are based on the allocation of the total accrued liability between Boston teachers and other members of the State-Boston Retirement System. If only the annuity savings fund and annuity reserve fund for Boston teachers were included as Commonwealth valuation assets, the overall Commonwealth unfunded liability would increase by approximately \$560 million and the overall funded ratio would decrease to 72.7%.

## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | FUNDING PROGRESS

#### 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".

The actuarial value of assets used to derive the UAL from January 1, 1990 to January 1, 1996 reflects the market value of plan assets. To reduce the potential volatility of the market value approach, in the January 1, 1998 actuarial valuation, we began implementing a method that averages realized and unrealized asset gains and losses over 5 years. Therefore, gains and losses in a given year are not fully reflected in the actuarial value of assets until 5 years later. On January 1, 1998, we began phasing in this methodology and used 97% of market value as the actuarial value of assets. This methodology was fully phased in as of January 1, 2001.

The chart below indicates the UAL, on an actuarial basis, decreased from \$13.4 billion on 1/03 to \$12.0 billion on 1/04. (On a market value basis, the UAL decreased from \$17.3 billion on 1/03 to \$14.3 billion on 1/04.) From 1998 - 2001, the market value of assets exceeded the actuarial value of assets. Consequently, the unfunded liability on an actuarial value basis was greater than the unfunded liability on a market value basis. For the last three valuations, the market value of assets has been less than the actuarial value of assets and, therefore, the UAL on an actuarial value basis has been less than the UAL on a market value basis.





## 2. EXECUTIVE SUMMARY *(continued)*

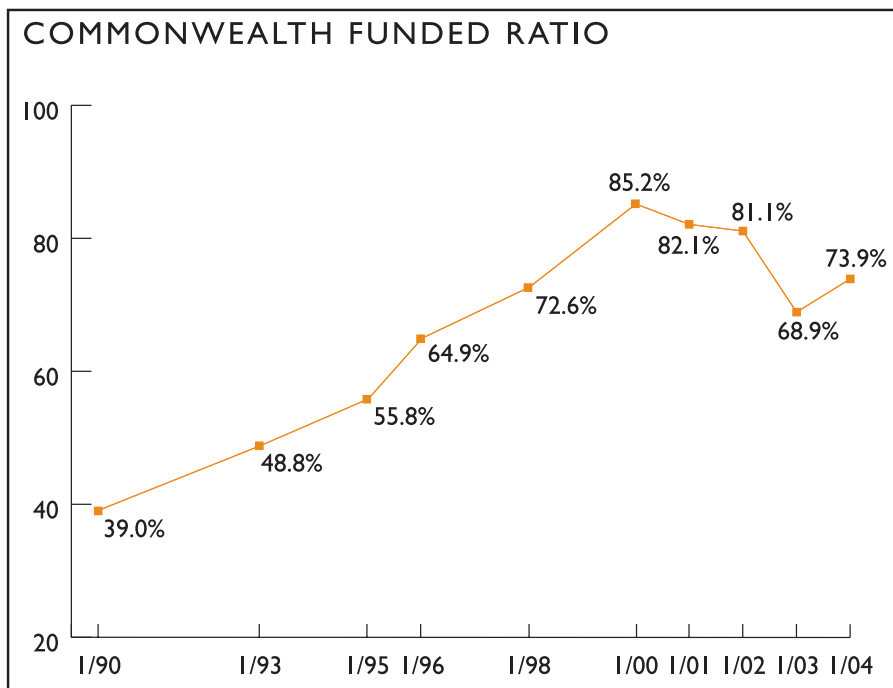
### PART C | FUNDING PROGRESS *(continued)*

#### 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".

The actuarial value of assets used to derive the funded ratio from January 1, 1990 to January 1, 1996 reflects the market value of plan assets. To reduce the potential volatility of the market value approach, in the January 1, 1998 actuarial valuation, we began implementing a methodology that averages realized and unrealized asset gains and losses over 5 years. Therefore, gains and losses in a given year are not fully reflected in the actuarial value of assets until 5 years later. On January 1, 1998, we began phasing in this methodology and used 97% of market value as the actuarial value of assets. The methodology was fully phased in as of January 1, 2001.

The chart below indicates the funded ratio on an actuarial basis increased from last year. (On a market value basis, the funded ratio increased from 59.9% to 68.8%.) From 1998 - 2001, the market value of assets exceeded the actuarial value of assets. Consequently, the funded ratio on an actuarial value basis was less than the funded ratio on a market value basis for those years. For the last three valuations, the market value of assets is less than the actuarial value of assets and, consequently, the funded ratio on an actuarial basis is greater than the funded ratio on a market value basis.

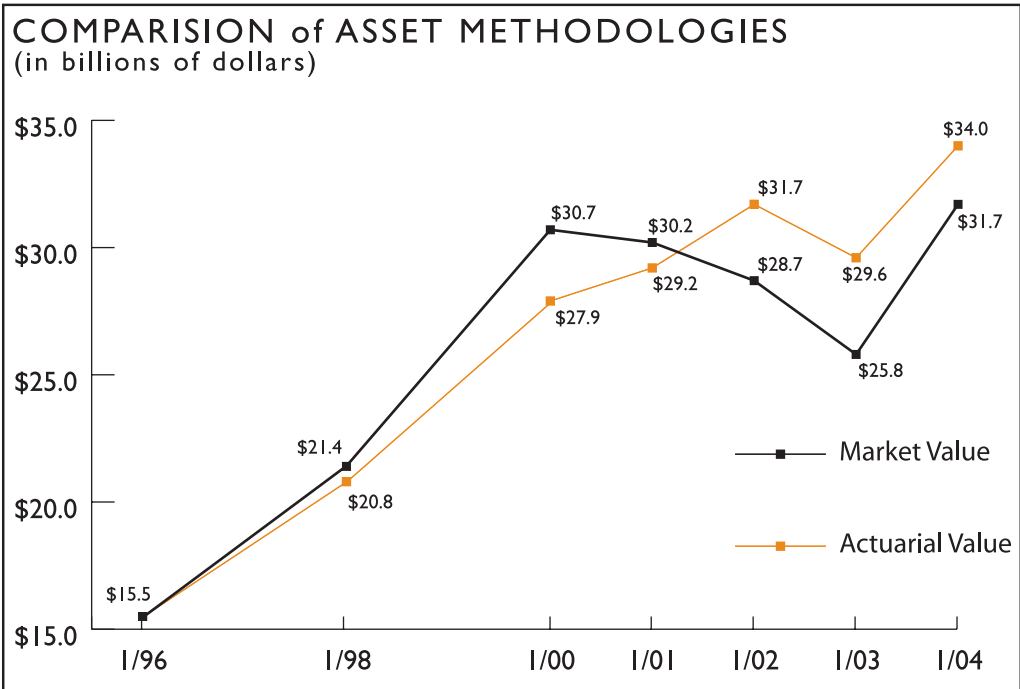


## 2. EXECUTIVE SUMMARY *(continued)*

### PART C | FUNDING PROGRESS *(continued)*

#### COMPARISON OF MARKET AND ACTUARIAL VALUE OF ASSETS

As part of the January 1, 1998 actuarial valuation, an actuarial value of assets methodology that smoothes investment gains and losses was adopted by the Commonwealth. Prior to 1998, the market value of assets was used in actuarial valuations. The goal of asset smoothing is to reduce the potential volatility of the market value basis. The actuarial method smoothes gains and losses over a 5-year period. Investment gains and losses are not fully realized until 5 years have elapsed. Therefore, in some years the actuarial value will be less than the market value, and in other years, it will exceed the market value.



### 3. SUMMARY OF VALUATION RESULTS

A. Number of Members	State	Teachers	Boston Teachers	COLA	Total
Active	80,122	87,934	5,955		174,011
Vested Terminated	2,966	N/A	169		3,135
Retired/ Beneficiaries	<u>51,418</u>	<u>39,341</u>	<u>2,992</u>		<u>93,751</u>
Total	134,506	127,275	9,116		270,897
<b>B. Total Payroll (\$000 omitted)</b>	<b>\$3,841,606</b>	<b>\$4,555,900</b>	<b>\$368,086</b>		<b>\$8,765,592</b>
<b>C. Normal Cost</b>					
Superannuation	\$322,426	\$444,962	\$34,922		\$802,310
Death	28,933	24,459	1,909		55,301
Disability	53,776	7,367	584		61,727
Termination	<u>46,164</u>	<u>56,911</u>	<u>4,211</u>		<u>107,286</u>
Total Normal Cost	\$451,299	\$533,699	\$41,626		\$1,026,624
Expected Employee Contributions	<u>311,619</u>	<u>432,568</u>	<u>34,097</u>		<u>778,284</u>
Net Employer Normal Cost	\$139,680	\$101,131	\$7,529		\$248,340
<b>D. Actuarial Liability</b>					
Active					
Superannuation	\$8,355,032	\$13,822,747	\$1,069,088		\$23,246,867
Death	242,958	184,208	15,588		442,754
Disability	271,064	71,696	6,067		348,827
Termination	<u>211,655</u>	<u>211,048</u>	<u>17,707</u>		<u>440,410</u>
Total Active	\$9,080,709	\$14,289,699	\$1,108,450		\$24,478,858
Vested Terminated (a)	307,645	300,000	33,896		641,541
Non-Vested Terminated	83,295		8,151		91,446
Retirees and Survivors	<u>9,524,404</u>	<u>9,929,360</u>	<u>871,600</u>	<u>522,000</u>	<u>20,847,364</u>
Total Actuarial Liability	\$18,996,053	\$24,519,059	\$2,022,097	\$522,000	\$46,059,209
<b>E. Actuarial Value of Assets</b>	15,930,753	17,074,650	1,039,774	0	34,045,177
<b>F. Unfunded Actuarial Liability</b>	<b>\$3,065,300</b>	<b>\$7,444,409</b>	<b>\$982,323</b>	<b>\$522,000</b>	<b>\$12,014,032</b>
<b>G. Funded Ratio: E/D</b>	<b>83.9%</b>	<b>69.6%</b>	<b>51.4%</b>	<b>0.0%</b>	<b>73.9%</b>

(a) State Teachers' amount is estimated and includes non-vested terminated members.

## 4. DEVELOPMENT OF THE ACTUARIAL GAIN OR LOSS

(in millions)

	State	State Teachers	Boston Teachers	Local COLA	Total
1. Unfunded Actuarial Liability (UAL) 1/1/2003	3,604	8,129	998	670	13,401
2. Employer Normal Cost	152	97	8	0	257
3. Interest on (1) and (2) at 8.25%	310	679	83	55	1,127
4. Allocation of appropriation paid during 2003	275	426	54	59	814
5. Interest on (4) assuming mid year payment	11	18	2	2	34
6. Expected UAL 1/04 (before ERIP): (1)+(2)+(3)-(4)-(5)	3,780	8,461	1,033	664	13,937
7. Increase due to ERIP	228	0	0	0	228
8. Expected UAL 1/04 after ERIP: (6)+(7)	4,008	8,461	1,033	664	14,165
9. UAL 1/1/04	3,065	7,445	982	522	12,014
10. Total gain/(loss): (8)-(9)	943	1,016	51	142	2,151

## 5. AUDIT INFORMATION

### PART A | OVERVIEW

We have included in this report the actuarial information required by GASB Statement No. 27. The Commonwealth of Massachusetts chose to begin implementing Statement No. 27 in Fiscal 1996.

Under GASB Statement No. 27, the calculation of an Annual Required Contribution (ARC) is required each year. This calculation is based on the same methods and assumptions as are applied in determining funding requirements, but with certain limiting parameters within which these methods and assumptions must fall. At this time, the methods and assumptions used by the Commonwealth to determine the funding schedule are well within the parameters established by Statement No. 27.

In order to calculate the ARC in the first year for which Statement No. 27 is in effect, a Net Pension Obligation (NPO) at transition must be calculated. This is essentially the cumulative difference between the employer's required contributions and the contributions actually made by the employer for all years beginning with Fiscal Year 1988.

As part of this valuation, we brought the NPO forward from FY03 to FY04. For FY04, in accordance with GASB Statement No. 27, amortization cost was determined on a schedule which is equivalent to that of the current schedule.

Note that, in any year, the amount of the ARC will not equal the Commonwealth's appropriation amounts because of the following:

1. The ARC is based upon the most recent valuation, whereas the funding schedule is generally submitted to the legislature 15 months after the valuation upon which it is based. The funding schedule is then set for the upcoming three fiscal years.
2. Amortization bases of actuarial gains and losses (typically 15 years) are part of the funding schedule. However, the amortization cost that GASB reflects is an amortization of the entire unfunded liability which is roughly equivalent to the current schedule.
3. Although there is no difference in the totals, contributions have been allocated slightly differently among the State and COLA portions. For purposes of Statement No. 27, a larger contribution was made to COLA, with lesser amounts to State. This was done so the NPO for the local COLA remains at zero. No assets are attributed to the local COLA.

## 5. AUDIT INFORMATION *(continued)*

### PART B | GASB STATEMENT NO. 27 (\$000's omitted)

	State	State Teachers	Boston Teachers	Local COLA	Total
I. Annual Required Contribution (ARC) for FY04					
Normal Cost	139,680	101,131	7,529	0	248,340
a. Amortization Cost	209,877	509,710	67,258	35,741	822,586
b. ARC: (a) + (b)	349,557	610,841	74,787	35,741	1,070,926
c.					
2. Amount under (over) funded from prior year (NPO)	(1,325,401)	(792,400)	65,142	0	(2,052,659)
3. Interest on NPO	(109,346)	(65,373)	5,374	0	(169,344)
4. Amortization of NPO	(90,749)	(54,255)	4,460	0	(140,543)
5. Pension Cost: (1c) + (3) – (4)	330,960	599,722	75,701	35,741	1,042,125
6. Actual Contribution *	246,754	359,476	45,364	35,741	687,335
7. (5) – (6)	84,206	240,246	30,337	0	354,790
8. Net Pension Obligation/(Asset): (2)+ (7)	(1,241,195)	(552,153)	95,480	0	(1,697,869)

\* allocation estimated

Figures may not add exactly due to rounding.

## 6. ASSETS

All figures are shown in thousands.

### PART A | STATE AND STATE TEACHERS' ASSET ALLOCATION

	State	State Teachers
Pension Reserves Investment Trust		
Market value	\$14,834,328	\$15,906,669
Actuarial value	\$15,930,753	\$17,074,650
Actuarial value as a percentage of market value	107.4%	107.3%

### PART B | BOSTON TEACHERS' ASSET ALLOCATION

For Boston Teachers, we assumed that the market value portion of total assets is allocated in the same proportion as shown in PERA's January 1, 1994 actuarial valuation report for the City of Boston. Assets were allocated to the teachers in the same proportion as the teachers' accrued liability compared to the system's total accrued liability at that time. Once the market value allocation is made, the actuarial value is determined based on the actuarial value as a percent of market value for the State and State Teachers' systems.

Total City of Boston assets (market value)	\$3,236,816
Assets allocated to Boston Teachers	
Market value (29.91% of City total)	\$968,132
Actuarial value (107.4% of market value)	\$1,039,774

## 6. ASSETS *(continued)*

### PART C | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

A. Development of 12/31/03 expected actuarial value of assets (AVA)	State	Teachers	Total
1. Market value (MV) 12/31/02	12,128,062	12,836,738	24,964,800
2. Actuarial value 12/31/02	15,424,416	16,353,468	31,777,884
3. Employee contributions 2003 (est)	305,000	415,000	720,000
4. Employer contributions 2003	334,000	426,000	760,000
5. Benefit payments 2003 (est)	(970,000)	(1,010,000)	(1,980,000)
6. Expected investment return on (2): 0.0825x(2)	1,272,514	1,349,161	2,621,675
7. Expected investment return on (3)+(4)+(5): $\frac{1}{2} \times 0.0825 \times [(3)+(4)+(5)]$	(13,654)	(6,971)	(20,625)
8. Expected AVA 12/31/03: (2)+(3)+(4)+(5)+(6)+(7)	16,352,277	17,526,658	33,878,934
B. Previous differences not yet amortized			
1. Unrecognized amount of 12/31/02 difference			
a. .2 x 1999 gain	364,114	370,010	734,124
b. .4 x 2000 gain	(535,274)	(517,419)	(1,052,693)
c. .6 x 2001 gain	(1,108,599)	(1,203,912)	(2,312,511)
d. .8 x 2002 gain	(2,016,595)	(2,165,409)	(4,182,004)
e. Total	(3,296,354)	(3,516,730)	(6,813,084)
C. Gain/(loss) from 2003			
1. Market value 12/31/03	14,834,328	15,906,669	30,740,997
2. Expected market value 12/31/03: A(8)+B(1e)	13,055,923	14,009,928	27,065,850
3. Gain/ (loss) from 2003 investment: (1)-(2)	1,778,405	1,896,741	3,675,147
D. Development of AVA 12/31/03			
1. 2003 gain/(loss)	1,778,405	1,896,741	3,675,147
2. 2002 gain/(loss)	(2,520,744)	(2,706,761)	(5,227,505)
3. 2001 gain/(loss)	(1,847,665)	(2,006,520)	(3,854,185)
4. 2000 gain/(loss)	(1,338,185)	(1,293,548)	(2,631,733)
5. 1999 gain/(loss)	1,820,572	1,850,049	3,670,621
6. 20% of 2003 gain/(loss)	355,681	379,348	735,029
7. 20% of 2002 gain/(loss)	(504,148)	(541,352)	(1,045,501)
8. 20% of 2001 gain/(loss)	(369,533)	(401,304)	(770,837)
9. 20% of 2000 gain/(loss)	(267,637)	(258,710)	(526,347)
10. 20% of 1999 gain/(loss)	364,114	370,010	734,124
11. Total	(421,523)	(452,008)	(873,531)
12. Actuarial value 12/31/03: A8+D11 (but not greater than 115% of MV)	15,930,753	17,074,650	33,005,403
13. Percentage of market value	107.4%	107.3%	107.4%



## 7. SYSTEM MEMBERSHIP

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.

### PART A | STATE ACTIVE MEMBERS

	Actives	Vested Terminations
Number of Members	80,122	2,966
Average Age	45.2	48.4
Average Service	12.1	15.1
Average Salary	\$47,947	\$47,964
Average Annuity Savings Fund Balance	\$39,062	\$47,659

### Age by Service Distribution of Active Members

Present Age	Years of Service							Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	
0 - 24	2,105	21						2,126
25 - 29	4,742	855	13					5,610
30 - 34	4,114	3,063	1,000	78				8,255
35 - 39	3,267	2,600	2,458	1,620	69			10,014
40 - 44	2,950	2,157	2,200	3,268	1,421	67		12,063
45 - 49	2,779	2,096	1,923	2,797	2,529	1,042	67	13,233
50 - 54	2,093	1,816	1,668	2,460	2,246	1,997	907	13,187
55 - 59	1,372	1,211	1,206	1,817	1,405	1,210	1,302	9,523
60 - 64	595	628	527	758	601	445	823	4,377
65+	188	241	191	248	213	146	507	1,734
Total	24,205	14,688	11,186	13,046	8,484	4,907	3,606	80,122

## 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	2,126	\$58,774,563	\$27,647
25 - 29	5,610	\$200,279,068	\$35,700
30 - 34	8,255	\$352,903,960	\$42,750
35 - 39	10,014	\$460,858,319	\$46,021
40 - 44	12,063	\$575,498,312	\$47,708
45 - 49	13,233	\$654,749,421	\$49,479
50 - 54	13,187	\$691,822,259	\$52,462
55 - 59	9,523	\$508,015,915	\$53,346
60 - 64	4,377	\$240,605,343	\$54,970
65+	1,734	\$98,098,961	\$56,574
Total	80,122	\$3,841,606,121	\$47,947

## 7. SYSTEM MEMBERSHIP *(continued)*

### PART B | STATE RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	41,492	695	2,639	6,592	51,418
Average Age	71.0	66.3	62.4	74.0	70.9
Average Annual Benefit	\$21,042	\$13,905	\$26,020	\$9,867	\$19,769

### Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	\$141,202,842	\$1,078,879	\$3,371,135	\$8,680,911	\$154,333,767
Pension	\$731,888,906	\$8,584,902	\$65,297,526	\$56,359,243	\$862,130,577
Total	\$873,091,748	\$9,663,781	\$68,668,661	\$65,040,154	\$1,016,464,344

## 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	206	\$5,000,280	\$24,273
40 - 44	378	\$7,698,418	\$20,366
45 - 49	929	\$18,019,964	\$19,397
50 - 54	2,043	\$44,834,985	\$21,946
55 - 59	5,466	\$139,416,322	\$25,506
60 - 64	7,172	\$181,891,660	\$25,361
65 - 69	7,434	\$170,048,188	\$22,874
70 - 74	8,147	\$167,890,620	\$20,608
75 - 79	8,152	\$142,518,239	\$17,483
80 - 84	6,286	\$85,616,613	\$13,620
85 - 89	3,540	\$37,960,203	\$10,723
90+	1,665	\$15,568,852	\$9,351
Totals	51,418	\$1,016,464,344	\$19,769

## 7. SYSTEM MEMBERSHIP *(continued)*

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 Teachers' Retirement System (TRS).

### PART C | STATE TEACHERS' ACTIVE MEMBERS

We made several assumptions about missing, questionable or unavailable data. Since credited service is not provided for most members, we estimated service based on the date of hire provided. The State Teachers' Retirement Board indicated that this date of hire represents the original date of hire/membership with the TRS. To the extent there are members with breaks in service, this methodology will overstate the plan's liability. For members with a questionable date of birth and/or date of hire, we assumed (based on credited service or date of birth) the member was hired at age 30.

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 \$20,000. For members with pay over \$100,000 we compared the annuity savings fund contributions to the salary, and recalculated the pay based on the contributions if there was a discrepancy.

Pay for all members hired in 2003 was annualized and determined in the same manner as above except for those with dates of hire in October through December. We assumed a rate of pay of \$45,000 (the average of the rest of the group) for these members.

We could not determine the number of vested terminations and instead estimated a combined inactive (terminated vested plus terminated with an ASF balance) liability. This is the same methodology we used last year.

## 7. SYSTEM MEMBERSHIP *(continued)*

### PART C | STATE TEACHERS' ACTIVE MEMBERS *(continued)*

	Actives
Number of Members	87,934
Average Age	45.0
Average Service	14.3
Average Salary	\$51,810
Average Annuity Savings Fund Balance	\$43,832

#### Age by Service Distribution of Active Members

Present Age	Years of Service							Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	
0 - 24	2,261	5						2,266
25 - 29	8,239	1,166						9,405
30 - 34	5,413	4,705	715	2				10,835
35 - 39	3,011	2,693	1,680	642				8,026
40 - 44	2,988	1,856	999	2,218	388	2		8,451
45 - 49	3,009	1,990	1,008	1,900	2,184	1,411	6	11,508
50 - 54	2,322	1,788	1,148	2,094	1,458	5,332	4,377	18,519
55 - 59	1,117	792	601	1,601	740	1,433	8,244	14,528
60 - 64	291	226	142	549	303	361	1,895	3,767
65+	49	35	28	88	58	67	304	629
Total	28,700	15,256	6,321	9,094	5,131	8,606	14,826	87,934

## 7. SYSTEM MEMBERSHIP *(continued)*

### PART C | STATE TEACHERS' ACTIVE MEMBERS *(continued)*

#### Salary by Age Distribution of Active Members

Present Age	Number of Members	Total Salary	Average Salary
0 - 24	2,266	\$81,289,896	\$35,874
25 - 29	9,405	\$361,336,873	\$38,420
30 - 34	10,835	\$466,928,397	\$43,094
35 - 39	8,026	\$378,200,605	\$47,122
40 - 44	8,451	\$419,499,540	\$49,639
45 - 49	11,508	\$603,010,282	\$52,399
50 - 54	18,519	\$1,073,456,989	\$57,965
55 - 59	14,528	\$900,229,825	\$61,965
60 - 64	3,767	\$233,805,077	\$62,067
65+	629	\$38,142,086	\$60,639
Total	87,934	\$4,555,899,571	\$51,810

## 7. SYSTEM MEMBERSHIP *(continued)*

### PART D | STATE TEACHERS' RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	35,395	476	303	3,167	39,341
Average Age	70.5	66.0	66.0	70.7	70.4
Average Annual Benefit	\$28,511	\$16,520	\$28,322	\$12,548	\$27,079

#### Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	\$102,013,583	\$389,473	\$231,375	\$2,023,840	\$104,658,271
Pension	\$907,119,943	\$7,474,110	\$8,350,235	\$37,715,467	\$960,659,755
Total	\$1,009,133,526	\$7,863,583	\$8,581,610	\$39,739,307	\$1,065,318,026



## 7. SYSTEM MEMBERSHIP *(continued)*

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

#### Benefit by Age Distribution

Present Age	Number of Members	Total Benefits	Average Benefits
Less than 40	104	\$1,633,329	\$15,705
40 – 44	32	\$395,049	\$12,345
45 – 49	83	\$1,359,400	\$16,378
50 – 54	588	\$10,403,221	\$17,693
55 – 59	4,654	\$158,688,589	\$34,097
60 – 64	7,945	\$280,499,498	\$35,305
65 – 69	7,315	\$224,769,011	\$30,727
70 – 74	6,586	\$171,792,092	\$26,084
75 – 79	5,079	\$106,734,310	\$21,015
80 – 84	3,357	\$57,050,319	\$16,994
85 – 89	2,037	\$30,010,354	\$14,733
90+	1,561	\$21,982,853	\$14,083
Totals	39,341	\$1,065,318,026	\$27,079

## 7. SYSTEM MEMBERSHIP *(continued)*

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.

### PART E | BOSTON TEACHERS' ACTIVE MEMBERS

	Actives	Vested Terminations
Number of Members	5,955	169
Average Age	45.4	50.0
Average Service	14.4	19.2
Average Salary	61,811	69,837
Average Annuity Savings Fund Balance	53,206	47,739

### Age by Service Distribution of Active Members

Present Age	Years of Service							Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30+	
0 - 24	136	2						138
25 - 29	523	74	7					604
30 - 34	333	293	76	19				721
35 - 39	189	147	165	60	8			569
40 - 44	129	113	110	194	30	1		577
45 - 49	127	92	104	235	112	83	1	754
50 - 54	98	85	110	273	140	301	157	1,164
55 - 59	65	62	66	184	96	119	454	1,046
60 - 64	21	23	23	64	41	30	101	303
65+	5	6	7	18	13	11	19	79
Total	1,626	897	668	1,047	440	545	732	5,955

## 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	138	\$5,706,105	\$41,349
25 - 29	604	\$28,290,564	\$46,839
30 - 34	721	\$39,009,598	\$54,105
35 - 39	569	\$32,018,764	\$56,272
40 - 44	577	\$34,992,623	\$60,646
45 - 49	754	\$48,351,760	\$64,127
50 - 54	1,164	\$80,799,284	\$69,415
55 - 59	1,046	\$72,841,821	\$69,638
60 - 64	303	\$20,963,397	\$69,186
65+	79	\$5,112,371	\$64,714
Total	5,955	\$368,086,289	\$61,811

## 7. SYSTEM MEMBERSHIP *(continued)*

### PART F | BOSTON TEACHERS' RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	2,645	44	66	237	2,992
Average Age	71.0	63.3	67.9	72.8	71.0
Average Annual Benefit	\$33,796	\$18,114	\$28,718	\$13,341	\$31,833

#### Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	\$8,615,029	\$48,749	\$72,388	\$110,714	\$8,846,880
Pension	\$80,776,563	\$748,269	\$1,822,990	\$3,051,085	\$86,398,907
Total	\$89,391,592	\$797,018	\$1,895,378	\$3,161,799	\$95,245,787

## 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	5	\$49,416	\$9,883
40 - 44	1	\$11,755	\$11,755
45 - 49	12	\$230,666	\$19,222
50 - 54	35	\$609,438	\$17,413
55 - 59	384	\$15,488,601	\$40,335
60 - 64	578	\$23,516,744	\$40,686
65 - 69	490	\$17,856,380	\$36,442
70 - 74	462	\$14,359,277	\$31,081
75 - 79	452	\$11,956,262	\$26,452
80 - 84	252	\$5,475,192	\$21,727
85 - 89	163	\$3,003,366	\$18,426
90+	158	\$2,688,689	\$17,017
Totals	2,992	\$95,245,787	\$31,833

## 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 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 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 an *Actuarial Gain*.

### PART 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, etc., so that 100% of gains and losses occurring 5 years ago are recognized. The actuarial value of assets will be adjusted, if necessary, in order to remain between 85% and 115% of market value.

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. For the 1998 valuation, we began to phase in an actuarial value of assets methodology by adopting an approach of using 97% of market value as the actuarial value of assets as of January 1, 1998. As of January 1, 2000 the phase-in determined that the actuarial value of assets was 91% of market value. The methodology was completely phased in effective with the January 1, 2001 actuarial valuation. As of January 1, 2003 the actuarial value of assets was adjusted to be 115% of the market value since the calculated value was above this threshold. The actuarial value of assets as of January 1, 2004 was approximately 107.4% of the market value.

## 9. ACTUARIAL ASSUMPTIONS

INVESTMENT RETURN 8.25% per year

INTEREST RATE CREDITED TO  
THE ANNUITY SAVINGS FUND 3.5% per year

COST OF LIVING  
INCREASES (COLA) 3% per year

MORTALITY RP-2000 Healthy Annuitant table projected 10 years with scale AA (gender distinct). This is applicable to both pre-retirement and post-retirement benefits. For disabled members, the mortality rate is assumed to be in accordance with the RP-2000 Table (gender distinct) set forward 3 years for males. It is assumed that 55% of pre-retirement deaths are job-related for Group 1 and 2 members and 90% are job-related for Group 3 and 4 members. For members retired under an Accidental Disability, 40% of deaths are assumed to be from the same cause as the disability.

SALARY INCREASE Based on an analysis of past experience. Annual rates are shown below.

<u>Service</u>	<u>Groups 1 &amp; 2</u>	<u>Group 3</u>	<u>Group 4</u>	<u>Teachers</u>
0	8.50%	9.50%	12.00%	9.50%
1	8.00%	9.00%	10.00%	8.50%
2	7.50%	8.50%	9.00%	8.00%
3	7.00%	8.00%	8.00%	7.50%
4	6.50%	7.50%	7.50%	7.00%
5	6.00%	7.00%	7.00%	6.75%
6	5.50%	6.75%	6.50%	6.50%
7	5.00%	6.50%	6.00%	6.25%
8	4.75%	6.25%	5.50%	6.00%
9	4.75%	6.00%	5.50%	5.75%
10	4.75%	5.75%	5.50%	5.50%
11	4.75%	5.50%	5.50%	5.50%
12	4.75%	5.50%	5.50%	5.25%
13	4.75%	5.50%	5.50%	5.25%
14-24	4.75%	5.50%	5.50%	5.00%
25+	4.75%	5.50%	5.50%	4.75%

## 9. ACTUARIAL ASSUMPTIONS *(continued)*

### RETIREMENT

Age	Group 1		Group 2	Group 3	Group 4	Male Teachers Service		Female Teachers Service	
	Male	Female				<20	20+	<20	20+
	45	0.000	0.000	0.000	0.020	0.030	0.00	0.00	0.00
46	0.000	0.000	0.000	0.020	0.030	0.00	0.00	0.00	0.00
47	0.000	0.000	0.000	0.050	0.030	0.00	0.00	0.00	0.00
48	0.000	0.000	0.000	0.050	0.030	0.00	0.00	0.00	0.00
49	0.000	0.000	0.000	0.050	0.030	0.00	0.00	0.00	0.00
50	0.015	0.030	0.020	0.050	0.100	0.00	0.01	0.00	0.01
51	0.010	0.030	0.020	0.075	0.050	0.00	0.01	0.00	0.01
52	0.010	0.030	0.020	0.075	0.100	0.00	0.01	0.00	0.01
53	0.015	0.025	0.040	0.075	0.100	0.00	0.01	0.00	0.01
54	0.020	0.035	0.050	0.075	0.150	0.00	0.02	0.00	0.01
55	0.040	0.050	0.100	0.110	0.300	0.02	0.03	0.02	0.04
56	0.035	0.060	0.100	0.150	0.150	0.04	0.03	0.04	0.04
57	0.040	0.055	0.100	0.110	0.200	0.07	0.05	0.07	0.05
58	0.045	0.070	0.100	0.110	0.150	0.08	0.07	0.08	0.07
59	0.050	0.090	0.130	0.110	0.250	0.09	0.10	0.09	0.11
60	0.080	0.080	0.150	0.100	0.300	0.12	0.20	0.12	0.16
61	0.100	0.100	0.150	0.100	0.150	0.15	0.30	0.15	0.20
62	0.160	0.160	0.150	0.250	0.250	0.18	0.35	0.18	0.25
63	0.160	0.160	0.150	0.250	0.150	0.15	0.35	0.15	0.25
64	0.160	0.160	0.200	0.250	0.150	0.25	0.30	0.25	0.30
65	0.250	0.250	0.200	0.500	0.500	0.40	0.50	0.40	0.40
66	0.250	0.250	0.200	0.500	0.500	0.40	0.30	0.40	0.30
67	0.250	0.250	0.200	0.500	0.500	0.40	0.30	0.40	0.25
68	0.250	0.250	0.200	0.500	0.500	0.40	0.30	0.40	0.35
69	0.250	0.250	0.200	0.500	0.500	0.40	0.40	0.40	0.35
70	1.000	1.000	1.000	1.000	1.000	1.00	1.00	1.00	1.00

Teachers electing the increased benefit under Chapter 114 of the Acts of 2000 were assumed to have higher rates of retirement from ages 54 to 62 if their service was greater than 30 years. These rates are the same for males and females.



## 9. ACTUARIAL ASSUMPTIONS *(continued)*

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

<u>Age</u>	<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>	<u>Group 4</u>	<u>Teachers</u>
20	0.00030	0.00060	0.00100	0.00410	0.00004
30	0.00033	0.00080	0.00160	0.00504	0.00006
40	0.00091	0.00166	0.00753	0.00608	0.00010
50	0.00168	0.00260	0.01559	0.00712	0.00050
60	0.00250	0.00350	0.02000	0.00780	0.00100

It is assumed that 55% of disabilities will be job-related for Group 1 and 2 members (other than Teachers), 90% will be job-related for Group 3 and 4 members, and 35% will be job-related for Teachers.

### WITHDRAWAL

Based on an 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 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

<u>Age</u>	<u>Service</u>		
	<u>0</u>	<u>5</u>	<u>10+</u>
20	0.180	0.000	0.000
30	0.150	0.090	0.041
40	0.125	0.070	0.031
50	0.100	0.048	0.021

<u>Service</u>	<u>Group 3</u>	<u>Group 4</u>
0	0.008	0.044
5	0.008	0.037
10	0.009	0.029
15	0.009	0.022
20+	0.009	0.015

# 9. ACTUARIAL ASSUMPTIONS *(continued)*

## Teachers

Age	Service	0		5		10+	
		Male	Female	Male	Female	Male	Female
20		0.090	0.060	0.040	0.090	0.010	0.040
30		0.108	0.116	0.043	0.090	0.010	0.040
40		0.093	0.114	0.049	0.070	0.015	0.031
50		0.059	0.068	0.042	0.045	0.019	0.019

## 10. SUMMARY OF PLAN PROVISIONS

### ADMINISTRATION

There are 106 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 establishes benefits, contribution requirements and an accounting and funds structure for all systems.

### MEMBERSHIP

Membership is mandatory for nearly all full-time employees. Eligibility with respect to part-time, provisional, temporary, seasonal or intermittent employment is governed by regulations promulgated by each retirement board, and approved by PERAC. Membership is optional for certain elected officials. There are 4 classes of membership in the Commonwealth:

**Group 1:**

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

**Group 2:**

Certain specified hazardous duty positions.

**Group 3:**

State police officers and inspectors

**Group 4:**

Police officers, firefighters, corrections officers, 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
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.

### 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

## 10. SUMMARY OF PLAN PROVISIONS (*continued*)

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 Groups 1 and 2. Most Group 4 members must retire at age 65. The mandatory retirement age for Group 3 members is 55, however, a Federal court order has enjoined the State Police from retiring any members on account of age.

### SUPERANNUATION RETIREMENT

A member 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

### AMOUNT OF BENEFIT

A member's annual allowance is determined by multiplying the member's 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 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.
- 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 three years (whether or not consecutive) preceding retirement.
- The Benefit Rate varies with the member's retirement age, but 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 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

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

each year of service in excess of 24. The amount determined cannot exceed 80% of the average salary.

- For Group 3 members, the rate is 3% for any age.

### DEFERRED VESTED BENEFIT

A participant who has completed 10 or more years of creditable service is eligible for a deferred vested retirement benefit. Elected officials and others who were hired prior to 1978 may be vested after 6 years in accordance with G.L. c. 32, s. 10.

The participant's accrued benefit is payable commencing at age 55, or the completion of 20 years, or may be deferred until later at the participant's option.

### WITHDRAWAL OF CONTRIBUTIONS

Member contributions may be withdrawn upon termination of employment. Employees who first become members on or after January 1, 1984, may receive only limited interest on their contributions if they voluntarily terminate their service. Those who leave service with less than 5 years receive no interest; those who leave service with greater than 5 but less than 10 years receive 50% of the interest credited.

### 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".

**Retirement Allowance:** 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/she will receive an allowance that is not less than the allowance he/she would have received if retired for superannuation.

## 10. SUMMARY OF PLAN PROVISIONS *(continued)*

### 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. 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 \$593.52 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 21 for any child who is a full time student at an accredited educational institution.

### 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 \$312 per year, per child, payable to the spouse or legal guardian until all dependent children reach age 18 or 21 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 \$100,000 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 \$6,000.

### DEATH IN ACTIVE SERVICE

**Eligibility:** At least 2 years of service

**Allowance:** An immediate allowance equal to that which would have been payable had the member retired and elected Option C on the day before his or her death. For death occurring prior to the member's superannuation retirement age, the age 55 benefit rate 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 \$3,000, 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 full time students, unless mentally or physically incapacitated.

### COST OF LIVING

Chapter 17 of the Acts of 1997 provides that the first \$12,000 of a retiree's total allowance is subject to an annual cost-of-living adjustment (COLA). Each year PERAC notifies the Massachusetts General Court of the percentage increase in the Consumer Price Index used for indexing Social Security benefits. This COLA is subject to an annual vote of the Massachusetts General Court, but cannot exceed 3.0%.

## 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 pre-deceases 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 pre-deceases 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.



## II. 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.

## II. 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

## II. 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 that is credited with an amount paid by the retirement board equaling the amount that would have been contributed by a member if the member had remained in active service instead of taking a military leave of absence. 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.

PERAC  
Five Middlesex Avenue  
Third Floor  
Somerville, MA 02145  
*Ph* 617 666 4446  
*Fax* 617 628 4002  
*TTY* 617 591 8917  
*Web* [www.mass.gov/PERAC](http://www.mass.gov/PERAC)