COMMONWEALTH ACTUARIAL VALUATION REPORT

January 1, 2002

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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 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, 2002, 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, 2001 actuarial valuation and reflect the experience analysis we conducted in 2000.

This valuation is based on member data as of December 31, 2001, which was supplied by the Boston, State, and 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, 2001 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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Member of the American Academy of Actuaries
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Joseph E. Connarton
Executive Director

Dated: September 24, 2002

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 4.15% per year.

The results of the January 1, 2002 actuarial valuation are as follows (000s omitted):

Total Normal Cost	$999,789
Expected Employee Contributions	765,807
Net Normal Cost	$233,982

Total Actuarial Liability	$39,067,455
Assets	$31,698,803
Unfunded Actuarial Liability	$7,368,652

2. EXECUTIVE SUMMARY *(continued)*

PART B | COMPARISON WITH PRIOR VALUATION AND EXPERIENCE ANALYSIS

A comparison of the current valuation and the January 1, 2001 valuation is shown below. ($000's omitted)

	1/1/02	1/1/01	Increase (Decrease)	Increase (Decrease)
Total Normal Cost	$999,789	$878,562	$121,227	13.8%
Expected Employee Contributions	765,807	624,175	141,632	22.7%
Net Normal Cost	$233,982	$254,387	($20,405)	(8.0%)
Actuarial Liability				
Actives	$23,227,798	$21,381,970	$1,845,828	8.6%
Retirees and Inactives	15,839,657	14,223,137	1,616,520	11.4%
Total	$39,067,455	$35,605,107	$3,462,348	9.7%
Assets	31,698,803	29,230,246	2,468,557	8.4%
Unfunded Actuarial Liability	$7,368,652	$6,374,861	$993,791	15.6%
Funded Ratio	81.1%	82.1%	(1.0%)	

The January 1, 2002 valuation results reflect the second 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 8. During 2001, there was an overall actuarial gain of $252 million. There was a non-investment gain on actuarial liability (before taking into account Chapter 114 of the Acts of 2000) of approximately $184 million and a gain on assets (on an actuarial value basis) of $68 million. Overall the plan closely followed expectations.

The return on assets was approximately 8.3% on an actuarial value basis. The return on a market value basis was –5.3%. The asset gain (actuarial basis) of $68 million reflects the difference between the 8.3% rate and the 8.25% assumed rate of return. The actuarial value of assets methodology has significantly mitigated the impact of the 2001 investment return 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, 2002 the calculated actuarial value of assets is 110.4% of the market value. As of January 1, 2001 the actuarial value of assets was 96.6% of the market value. The investment losses in 2000 and 2001 have determined a smoothed actuarial value of assets in excess of the market value, while in prior years the actuarial value of assets was less than the market value of assets. For a comparison of the market and actuarial value of assets since 1996 see page 7.

Chapter 114 of the Acts of 2000, An Act Improving Teacher Recruitment, Retention and Retirement was implemented in 2001. Our report, issued in December 2001, showed that the actuarial accrued liability for both the active and retired members increased by approximately $1.5 billion to reflect Chapter 114. In addition, net normal cost decreased approximately $70 million primarily due to the increase in employee contributions to an 11% rate for members who elected to participate in the program.

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 salary and other 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.

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 $600 million and the overall funded ratio would decrease to 79.6%.

2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDING PROGRESS

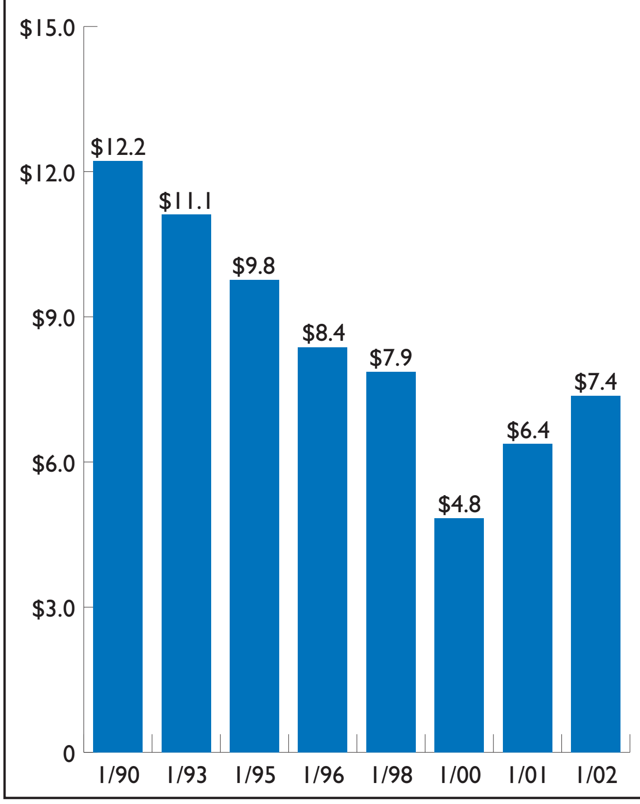
UNFUNDED LIABILITY

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, increased from $6.4 billion on 1/01 to $7.4 billion on 1/02. On a market value basis, the increase is significantly greater ($5.4 billion on 1/01 compared to $10.4 billion on 1/02) due to the -5.3% market value return in 2001. The asset smoothing methodology used in the development of the actuarial value of assets has mitigated the market value results. 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. With this valuation, the market value of assets is less than the actuarial value of assets and the UAL on an actuarial value basis is less than the UAL on a market value basis.

COMMONWEALTH UNFUNDED LIABILITY
(in billions of dollars)



2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDING PROGRESS *(continued)*

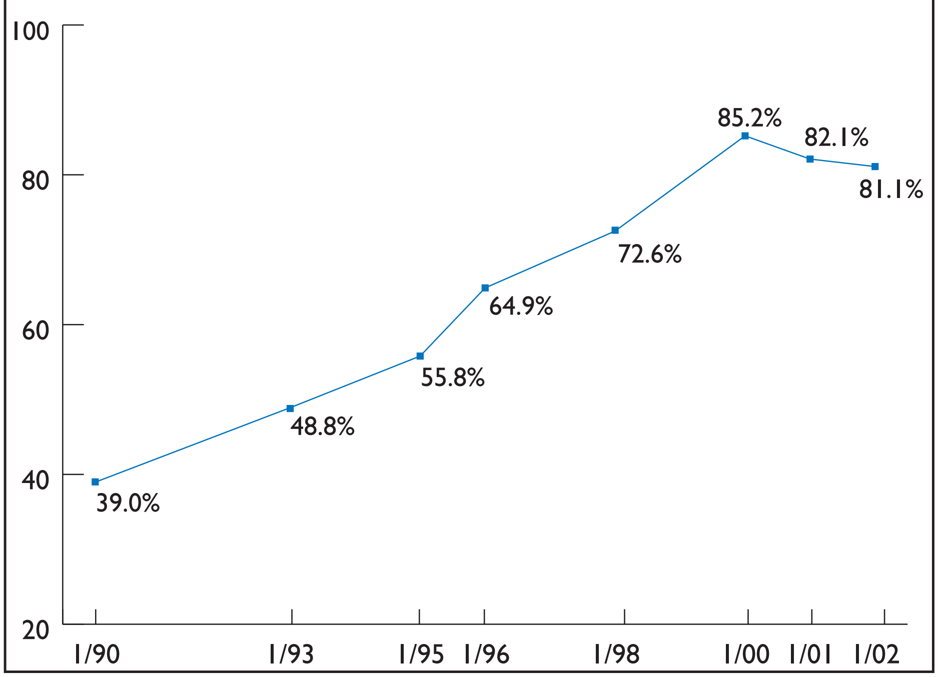
FUNDED RATIO

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 decreased only slightly from last year. On a market value basis the decrease in funded ratio is significantly greater (84.9% on 1/01 to 73.5% on 1/02) due to the -5.3% market value return in 2001. The asset smoothing methodology used in the development of the actuarial value of assets has mitigated the market value results. 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. With this valuation, the market value of assets is less than the actuarial value of assets and the funded ratio on an actuarial basis is greater than the funded ratio on a market value basis.

COMMONWEALTH FUNDED RATIO



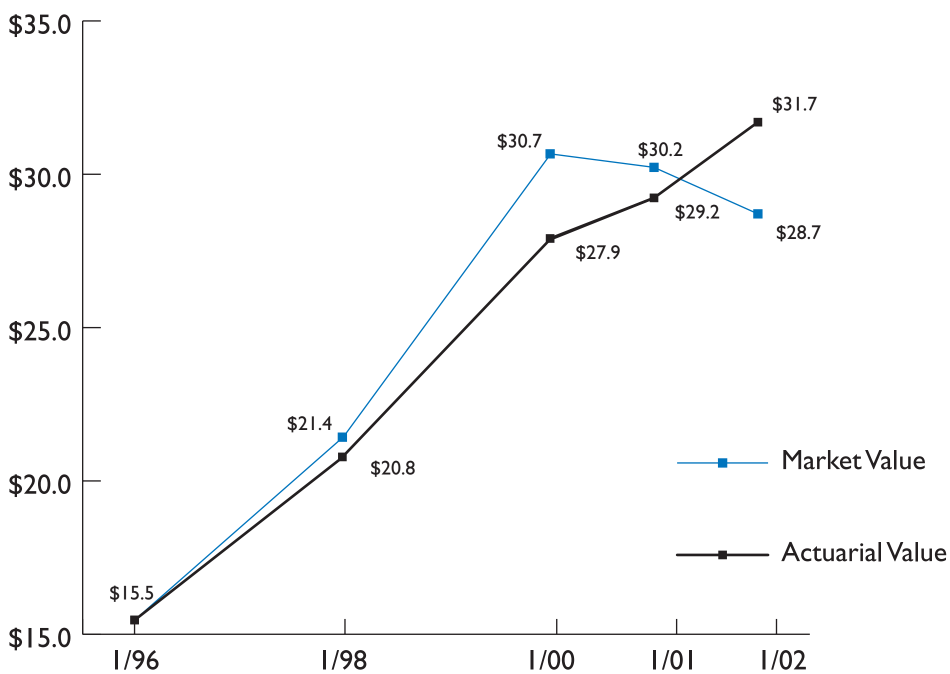
2. EXECUTIVE SUMMARY *(continued)*

PART C | FUNDING PROGRESS *(continued)*

COMPARISION 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.

COMPARISION of ASSET METHODOLOGIES
(in billions of dollars)



3. SUMMARY OF VALUATION RESULTS

A. Number of Members	State	Teachers	Boston Teachers	COLA	Total
Active	88,518	89,427	6,277		184,222
Vested Terminated	2,842	N/A	128		2,970
Retired/ Beneficiaries	44,313	34,970	2,593		81,876
Total	135,673	124,397	8,998		269,068
B. Total Payroll ($000 omitted)	$4,034,236	$4,263,661	$369,595		$8,667,492
C. Normal Cost					
Superannuation	$335,749	$403,619	$34,582		$773,950
Death	29,473	23,315	1,963		54,751
Disability	53,823	7,042	601		61,466
Termination	53,758	51,573	4,291		109,622
Total Normal Cost	$472,803	$485,549	$41,437		$999,789
Expected Employee Contributions	322,388	408,940	34,479		765,807
Net Employer Normal Cost	$150,415	$76,609	$6,958		$233,982
D. Actuarial Liability					
Active					
Superannuation	$8,390,612	$12,588,709	$1,082,946		$22,062,267
Death	226,043	200,369	17,028		443,440
Disability	225,641	78,802	6,669		311,112
Termination	218,918	174,789	17,272		410,979
Total Active	$9,061,214	$13,042,669	$1,123,915		$23,227,798
Vested Terminated (a)	273,133	200,000	19,427		492,560
Non-Vested Terminated	70,809	N/A	3,975		74,784
Retirees and Survivors	6,556,074	7,377,291	608,948	730,000	15,272,313
Total Actuarial Liability	$15,961,230	$20,619,960	$1,756,265	$730,000	$39,067,455
E. Actuarial Value of Assets	15,002,313	15,712,183	984,307	0	31,698,803
F. Unfunded Actuarial Liability	$958,917	$4,907,777	$771,958	$730,000	$7,368,652
G. Funded Ratio: E/D	94.0%	76.2%	56.0%	0.0%	81.1%

(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) 1/01	1,248	3,780	583	764	6,375
2. Employer Normal Cost	150	96	8	0	254
3. Interest on (1) and (2) at 8.25%	115	320	49	63	547
4. Allocation of appropriation paid during 2001	243	555	77	92	967
5. Interest on (4) assuming mid year payment	10	23	3	4	40
6. Expected UAL 1/02 (before Chapter 114 of the Acts of 2000): (1)+(2)+(3)-(4)-(5)	1,260	3,618	560	731	6,169
7. Increase in UAL due to Chapter 114	0	1,307	145	0	1,452
8. Expected UAL 1/02 after Chapter 114: (6)+(7)	1,260	4,925	705	731	7,621
9. UAL 1/1/02	959	4,908	772	730	7,369
10. Total gain/(loss): (8)-(9)	301	17	(67)	1	252

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 FY01 to FY02. For FY02, 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 <u>amount</u> 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
1. Annual Required Contribution (ARC) for FY02					
a. Normal Cost	150,415	76,609	41,436	0	268,460
b. Amortization Cost	65,380	334,616	52,567	49,772	502,335
c. ARC: (a) + (b)	215,795	411,225	94,003	49,772	770,795
2. Amount under (over) funded from prior year (NPO)	(1,351,592)	(998,513)	(815)	0	(2,350,920)
3. Interest on NPO	(111,506)	(82,377)	(67)	0	(193,951)
4. Amortization of NPO	(92,152)	(68,079)	(56)	0	(160,287)
5. Pension Cost: (1c) + (3) – (4)	196,441	396,927	93,992	49,772	737,131
6. Actual Contribution *	266,660	410,143	51,833	49,772	778,408
7. (5) – (6)	(70,219)	(13,216)	42,159	0	(41,277)
8. Net Pension Obligation/(Asset): (2)+ (7)	(1,421,811)	(1,011,729)	41,343	0	(2,392,197)

* allocation estimated

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	$13,597,500	$14,219,129
Actuarial value	$15,002,313	$15,712,183
Actuarial value as a percentage of market value	110.3%	110.5%

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)	$2,980,883
Assets allocated to Boston Teachers	
Market value (29.91% of City total)	$891,582
Actuarial value (110.4% of market value)	$984,307

6. ASSETS *(continued)*

PART C | DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

A. Development of 12/31/01 expected actuarial value of assets (AVA)	State	Teachers	Total
1. Market value 12/31/00	14,385,684	14,920,610	29,306,294
2. Actuarial value 12/31/00	13,921,533	14,390,340	28,311,873
3. Employee contributions 2001 (est)	289,481	313,168	602,649
4. Employer contributions 2001	335,000	555,000	890,000
5. Benefit payments 2001 (est)	(710,000)	(755,000)	(1,465,000)
6. Expected investment return on (2): 0.0825x(2)	1,148,526	1,187,203	2,335,730
7. Expected investment return on (3)+(4)+(5): ½x 0.0825 x [(3)+(4)+(5)]	(3,528)	4,668	1,141
8. Expected AVA 12/31/01: (2)+(3)+(4)+(5)+(6)+(7)	14,981,013	15,695,379	30,676,392
B. Previous differences not yet amortized			
1. Unrecognized amount of 12/31/00 difference			
a. .2* 97 gain	146,356	158,535	304,891
b. .4* 98 gain	296,000	296,544	592,545
c. .6* 99 gain	1,092,343	1,110,029	2,202,373
d. .8* 00 gain	(1,070,548)	(1,034,839)	(2,105,387)
e. Total	464,153	530,270	994,422
C. Gain/(loss) from 2001			
1. Market value 12/31/01	13,597,500	14,219,129	27,816,629
2. Expected market value 12/31/01: A(8)+B(1e)	15,445,165	16,225,649	31,670,814
3. Gain/ (loss) from 2001 investment: (1)-(2)	(1,847,665)	(2,006,520)	(3,854,185)
D. Development of AVA 12/31/01			
1. 01 gain	(1,847,665)	(2,006,520)	(3,854,185)
2. 00 gain	(1,338,185)	(1,293,548)	(2,631,733)
3. 99 gain	1,820,572	1,850,049	3,670,621
4. 98 gain	740,001	741,361	1,481,362
5. 97 gain	731,780	792,676	1,524,456
6. 20% of 2001 g/(l)	(369,533)	(401,304)	(770,837)
7. 20% of 2000 g/(l)	(267,637)	(258,710)	(526,347)
8. 20% of 1999 g/(l)	364,114	370,010	734,124
9. 20% of 1998 g/(l)	148,000	148,272	296,272
10. 20% of 1997 g/(l)	146,356	158,535	304,891
11. Total	21,301	16,804	38,104
12. Actuarial value 12/31/01:A8+D11	15,002,313	15,712,183	30,714,496
13. % of market value	110.3%	110.5%	110.4%

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	88,518	2,842
Average Age	45.2	48.3
Average Service	12.1	15.3
Average Salary	$45,575	$42,756
Average Annuity Savings Fund Balance	$35,455	$45,304

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	2,701	12						2,713
25 - 29	5,588	742	20					6,350
30 - 34	5,547	2,706	1,239	76				9,568
35 - 39	4,067	2,373	2,877	1,622	112			11,051
40 - 44	3,640	1,991	2,710	3,074	1,585	40		13,040
45 - 49	3,140	1,909	2,357	2,754	2,817	818	49	13,844
50 - 54	2,498	1,627	2,053	2,465	2,539	1,907	792	13,881
55 - 59	1,527	1,159	1,540	1,852	1,672	1,256	1,405	10,411
60 - 64	679	553	748	928	862	557	794	5,121
65+	231	262	397	451	503	257	438	2,539
Total	29,618	13,334	13,941	13,222	10,090	4,835	3,478	88,518

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	2,713	$74,936,209	$27,621
25 - 29	6,350	$219,346,801	$34,543
30 - 34	9,568	$389,994,563	$40,760
35 - 39	11,051	$481,832,345	$43,601
40 - 44	13,040	$589,927,742	$45,240
45 - 49	13,844	$659,848,502	$47,663
50 - 54	13,881	$696,084,678	$50,147
55 - 59	10,411	$529,343,522	$50,845
60 - 64	5,121	$261,380,348	$51,041
65+	2,539	$131,541,421	$51,808
Total	88,518	$4,034,236,131	$45,575

7. SYSTEM MEMBERSHIP *(continued)*

PART B | STATE RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	34,540	722	2,527	6,524	44,313
Average Age	72.9	66.4	62.5	73.6	72.3
Average Annual Benefit	$17,213	$13,208	$23,653	$8,877	$16,287

Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	$94,155,494	$1,024,327	$2,761,895	$7,610,952	$105,552,668
Pension	$500,364,407	$8,512,151	$57,008,084	$50,303,914	$616,188,556
Total	$594,519,901	$9,536,478	$59,769,979	$57,914,866	$721,741,224

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	199	$4,253,746	$21,376
40 - 44	333	$5,783,033	$17,366
45 - 49	735	$13,573,119	$18,467
50 - 54	1,550	$28,986,912	$18,701
55 - 59	2,977	$55,722,188	$18,718
60 - 64	4,441	$87,488,390	$19,700
65 - 69	6,953	$138,441,499	$19,911
70 - 74	8,216	$149,262,377	$18,167
75 - 79	8,193	$125,131,176	$15,273
80 - 84	6,032	$70,295,824	$11,654
85 - 89	3,182	$29,678,554	$9,327
90+	1,502	$13,124,406	$8,738
Totals	44,313	$721,741,224	$16,287

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 without a 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 or current age if less than 30.

Members whose reported pay was less than $7,000 were assumed to be inactive unless additional information was provided to show these members were active. For members with reported pay between $7,000 and $10,000 and extremely low ASF contributions, we used an estimated pay of $30,000.

Pay for 2001 was then estimated for all other members based on the annuity savings fund contributions for the year and the contribution rate (or rates) for the member. This methodology was complicated by the implementation of Chapter 114 of the Acts of 2000 and an 11% contribution rate (effective July 1, 2001) for members accepting this provision.

After determining the estimated pay, we reviewed whether calculated pay was reasonable for all members with pay in excess of $100,000.

Pay for all members hired in 2001 was annualized and determined in the same manner as above except for those with dates of hire in November and December. We assumed a rate of pay of $40,000 for them.

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.

We believe all of the payroll changes we assumed for this valuation, in aggregate, combined with using total creditable service based on the original date of hire with the TRS, are conservative and, in all likelihood, overstate the plan liabilities that would be determined if the payroll and total credited service for each member were accurately reflected in the data made available to PERAC.

7. SYSTEM MEMBERSHIP *(continued)*

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

	Actives
Number of Members	89,427
Average Age	44.8
Average Service	14.6
Average Salary	$47,678
Average Annuity Savings Fund Balance	$38,710

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	2,765	2						2,767
25 - 29	8,611	915	1					9,527
30 - 34	6,120	3,902	347	3				10,372
35 - 39	3,327	1,898	1,661	499	2			7,387
40 - 44	3,349	1,565	1,290	1,977	569	8		8,758
45 - 49	3,225	1,694	1,381	1,578	3,430	2,462	3	13,773
50 - 54	2,258	1,386	1,630	1,443	1,569	6,763	5,487	20,536
55 - 59	846	523	888	859	633	1,457	7,149	12,355
60 - 64	214	123	270	286	246	384	1,821	3,344
65+	39	28	63	52	50	79	297	608
Total	30,754	12,036	7,531	6,697	6,499	11,153	14,757	89,427

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	2,767	$88,312,890	$31,916
25 - 29	9,527	$333,455,991	$35,001
30 - 34	10,372	$402,920,475	$38,847
35 - 39	7,387	$317,818,252	$43,024
40 - 44	8,758	$401,550,109	$45,850
45 - 49	13,773	$684,661,270	$49,710
50 - 54	20,536	$1,099,924,579	$53,561
55 - 59	12,355	$700,773,947	$56,720
60 - 64	3,344	$198,627,120	$59,398
65+	608	$35,616,804	$58,580
Total	89,427	$4,263,661,437	$47,678

7. SYSTEM MEMBERSHIP *(continued)*

PART D | STATE TEACHERS' RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	31,136	489	286	3,059	34,970
Average Age	71.3	66.1	65.3	68.7	70.9
Average Annual Benefit	$24,191	$15,475	$25,757	$10,044	$22,845

Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	$54,732,222	$245,018	$137,425	$1,018,362	$56,133,027
Pension	$698,491,520	$7,322,415	$7,229,185	$29,707,531	$742,750,651
Total	$753,223,742	$7,567,433	$7,366,610	$30,725,893	$798,883,678

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	217	$1,773,238	$8,172
40 – 44	23	$212,256	$9,229
45 – 49	125	$1,440,640	$11,525
50 – 54	773	$11,491,073	$14,866
55 – 59	3,352	$91,776,563	$27,380
60 – 64	6,010	$177,075,923	$29,464
65 – 69	6,843	$190,169,743	$27,790
70 – 74	6,312	$146,002,117	$23,131
75 – 79	4,513	$83,038,630	$18,400
80 – 84	3,245	$48,709,935	$15,011
85 – 89	1,941	$26,139,370	$13,467
90+	1,616	$21,054,190	$13,029
Totals	34,970	$798,883,678	$22,845

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	6,277	128
Average Age	45.7	51.6
Average Service	14.8	18.4
Average Salary	$58,881	$56,111
Average Annuity Savings Fund Balance	$48,699	$48,650

Age by Service Distribution of Active Members

Present Age	Years of Service 0 - 4	5 –9	10 - 14	15 - 19	20 - 24	25 – 29	30+	Total
0 - 24	192							192
25 - 29	556	70	2					628
30 - 34	367	246	37	6				656
35 - 39	190	134	136	38	1			499
40 - 44	144	127	146	165	24	2		608
45 - 49	151	119	147	209	151	137	2	916
50 - 54	120	93	151	295	95	339	311	1,404
55 - 59	59	48	67	126	56	117	457	930
60 - 64	16	20	32	58	28	48	147	349
65+	2	2	9	13	12	18	39	95
Total	1,797	859	727	910	367	661	956	6,277

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	192	$7,365,875	$38,364
25 - 29	628	$27,373,198	$43,588
30 - 34	656	$33,110,132	$50,473
35 - 39	499	$27,735,310	$55,582
40 - 44	608	$34,986,724	$57,544
45 - 49	916	$55,801,365	$60,919
50 - 54	1,404	$91,839,119	$65,412
55 - 59	930	$61,798,142	$66,450
60 - 64	349	$23,438,329	$67,159
65+	95	$6,146,729	$64,702
Total	6,277	$369,594,923	$58,881

7. SYSTEM MEMBERSHIP *(continued)*

PART F | BOSTON TEACHERS' RETIREES AND SURVIVORS

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Number of Members	2,251	47	60	235	2,593
Average Age	72.7	63.4	69.8	72.5	72.4
Average Annual Benefit	$28,249	$17,643	$24,557	$12,416	$26,537

Benefit by Payment and Retirement Type

	Superannuation	Ordinary Disability	Accidental Disability	Survivors	Total
Annuity	$3,643,027	$45,325	$22,356	$66,038	$3,776,746
Pension	$59,945,800	$783,912	$1,451,089	$2,851,806	$65,032,607
Total	$63,588,827	$829,237	$1,473,445	$2,917,844	$68,809,353

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	$64,656	$10,776
40 - 44	2	$24,383	$12,192
45 - 49	14	$133,219	$9,516
50 - 54	52	$921,356	$17,718
55 - 59	238	$7,378,777	$31,003
60 - 64	381	$12,995,456	$34,109
65 - 69	428	$13,944,199	$32,580
70 - 74	461	$13,072,403	$28,357
75 - 79	397	$9,586,635	$24,148
80 - 84	267	$5,026,447	$18,826
85 - 89	161	$2,734,175	$16,982
90+	186	$2,927,647	$15,740
Totals	2,593	$68,809,353	$26,537

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

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. The actuarial value of assets as of January 1, 2002 is approximately 110.4% of the market value and reflects smoothing of the market value loss on assets in 2000 and 2001.

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.

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.

Service	Groups 1& 2	Group 3	Group 4	Teachers
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

	Group 1		Group 2	Group 3	Group 4	Male Teachers Service		Female Teachers Service	
Age	Male	Female				<20	20+	<20	20+
45	0.000	0.000	0.000	0.020	0.030	0.00	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 56 to 59 if their service was greater than 30 years. The rate at age 56 is 0.075, and the rate for ages 57-59 is 0.25. 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.

Age	Group 1	Group 2	Group 3	Group 4	Teachers
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

Age		Service	
	0	5	10+
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

Service	Group 3	Group 4
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 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 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 $559.44 per year (or $312.00 per year in systems in which the local option contained in G.L. c. 32, s.7(2)(a)(iii) has not been adopted), 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.

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 3l 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 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.