

*Commonwealth of Massachusetts*

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# ACTUARIAL VALUATION REPORT

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**As of January 1, 2001**

**for the**

**Commonwealth's Total Pension Obligation**

**Public Employee Retirement  
Administration Commission**

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Section I  
Introduction and 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, 2001 pursuant to Chapter 32 of the General Laws of the Commonwealth of Massachusetts and based on the plan provisions at that time. The actuarial assumptions used to calculate the accrued liability and the normal cost were revised with this valuation to reflect the experience analysis we conducted last year. The methodology used to determine the actuarial value of assets adopted as part of the January 1, 1998 valuation has now been completely phased-in

This valuation was based on member data as of December 31, 2000, 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, 2000 was provided by the Pension Reserve Investment Management Board and by the Annual Statement of Financial Condition submitted to this office by the Boston Retirement Board. Both the membership data and financial information were reviewed for reasonableness but not audited by us.

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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Enrolled Actuary Number 99-4709

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Joseph E. Connarton  
Executive Director  
Dated: September 19, 2001

Section II  
Summary Discussion

A. Costs under Current Valuation

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, 2018. Under the present schedule, the amortization payments to eliminate the initial unfunded liability by the end of FY2018 are level.

The results of the January 1, 2001 actuarial valuation are as follows (\$000 omitted):

Total Normal Cost	\$878,562
Employee Contributions	<u>624,175</u>
Net Normal Cost	<u>\$254,387</u>
Total Actuarial Liability	\$35,605,107
Assets (Actuarial Value)	<u>29,230,246</u>
Unfunded Actuarial Liability	<u>\$6,374,861</u>

Section II  
Summary Discussion (Continued)

B. Comparison with Prior Valuation

A comparison of the current valuation and the January 1, 2000 valuation is shown below.  
(\$000's omitted).

	<u>1/1/01</u>	<u>1/1/00</u>	<u>Increase (Decrease)</u>	<u>Increase (Decrease)</u>
Total Normal Cost	\$878,562	\$968,764	(\$90,202)	(9.3%)
Employee Contributions	<u>624,175</u>	<u>577,600</u>	<u>46,575</u>	<u>8.1%</u>
Net Normal Cost	<u>\$254,387</u>	<u>\$391,164</u>	<u>(\$136,777)</u>	<u>(35.0%)</u>
Actuarial Liability				
Actives	\$21,381,970	\$19,641,978	\$1,739,992	8.9%
Retirees and Inactives	<u>14,223,137</u>	<u>13,100,660</u>	<u>1,122,477</u>	<u>8.6%</u>
Total	\$35,605,107	\$32,742,638	\$2,862,469	8.7%
Assets	<u>29,230,246</u>	<u>27,905,556</u>	<u>1,324,690</u>	<u>4.7%</u>
Unfunded Actuarial Liability	<u>\$6,374,861</u>	<u>\$4,837,082</u>	<u>\$1,537,779</u>	<u>31.8%</u>
Funded Ratio	<u>82.1%</u>	<u>85.2%</u>	<u>(3.1%)</u>	

The January 1, 2001 valuation results reflect revised actuarial assumptions based on the Experience Study Analysis we conducted last year. The revised assumptions increased the accrued liability by approximately \$810 million and decreased the normal cost by approximately \$155 million. The net result of this change would decrease the Commonwealth funding schedule by approximately \$80 million per year assuming level amortization of the unfunded liability with payments until Fiscal Year 2018.

The development of the actuarial gain/(loss) is shown on page 8. During 2000, there was an overall actuarial loss of \$936 million which primarily reflects the actual investment return during the year. The return on assets was 4.7% on an actuarial value basis. The asset loss (actuarial basis) of \$1.1 billion reflects the difference between the 4.7% rate and the 8.25% assumed rate of return. There was a non-investment related gain (gain on actuarial accrued liability) of \$176 million.

This valuation completes the phase-in methodology with respect to the actuarial value of assets. As of January 1, 2001 the calculated actuarial value of assets is 96.6% of the market value. As of January 1, 2000 the actuarial value of assets was 91% of the market value under the phase-in approach. This illustrates how the actuarial value of assets approach somewhat mitigates the effect of the actual investment return in 2000.

Section II  
Summary Discussion (Continued)

The January 1, 2001 data also reflects a review and update by the State Retirement Board of total creditable service for all members. Service provided in prior valuations reflected only service with the State Retirement System. The service provided for this valuation reflects the actual total creditable service from all systems for each member. This methodology improves the accuracy of the valuation results.

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 VII. We believe our assumptions with respect to data to be conservative based on our detailed review and comparison of salary and other information provided to us as part of the January 1, 2000, 1999, and 1998 data submissions, and our discussions and individual data requests concerning various other issues. 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 in valuation assets, the overall Commonwealth unfunded liability would increase by approximately \$588 million and the overall funded ratio would decrease to 80.4%.

Section II

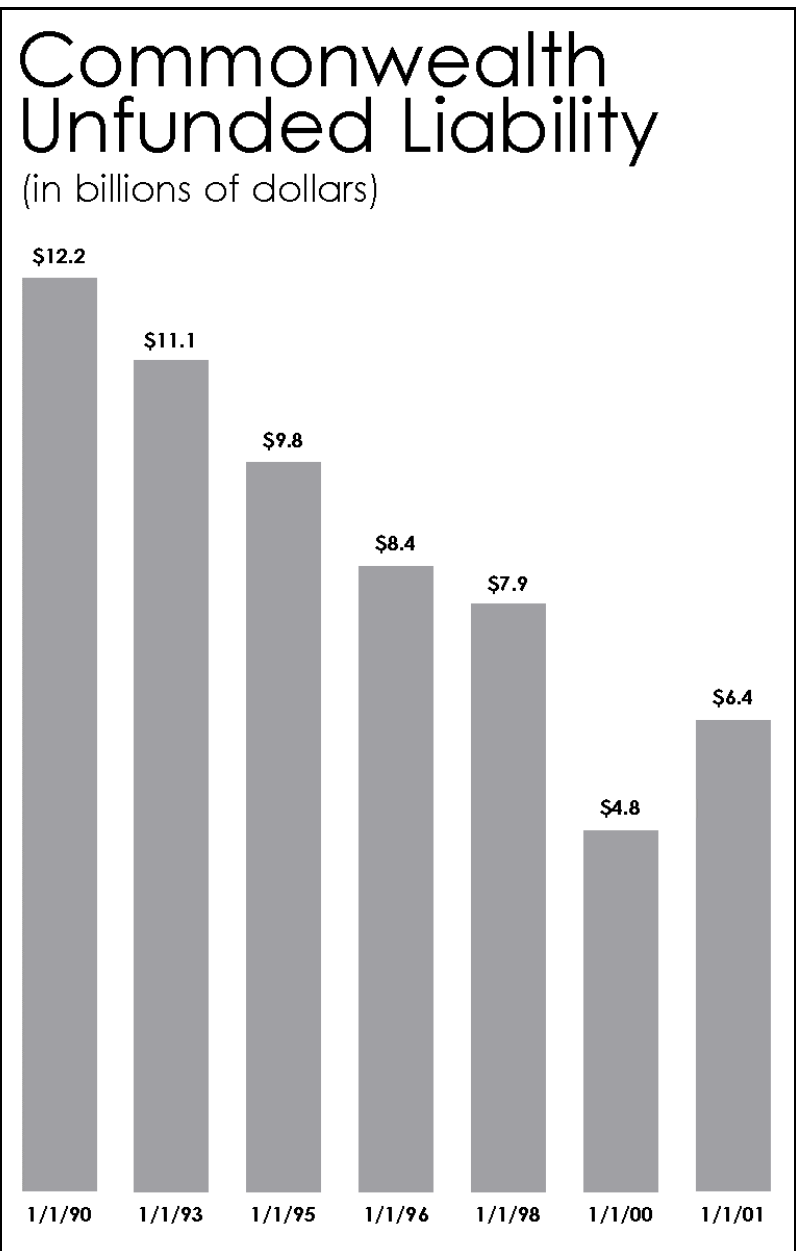
Summary Discussion (Continued)

C. Funding Progress

Unfunded Liability

The chart below shows the total Commonwealth 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. In the January 1, 1998 actuarial valuation, we began implementing a method that averages realized and unrealized asset gains and losses



over 5 years to reduce the potential volatility of the market value approach. 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. As of January 1, 2000, we used 91% of market value as the actuarial value of assets. With this valuation, the methodology has been completely phased-in.

If market value of assets were used in the January 1, 2001 valuation, the unfunded liability would be \$5.4 billion.

Section II

Summary Discussion (Continued)

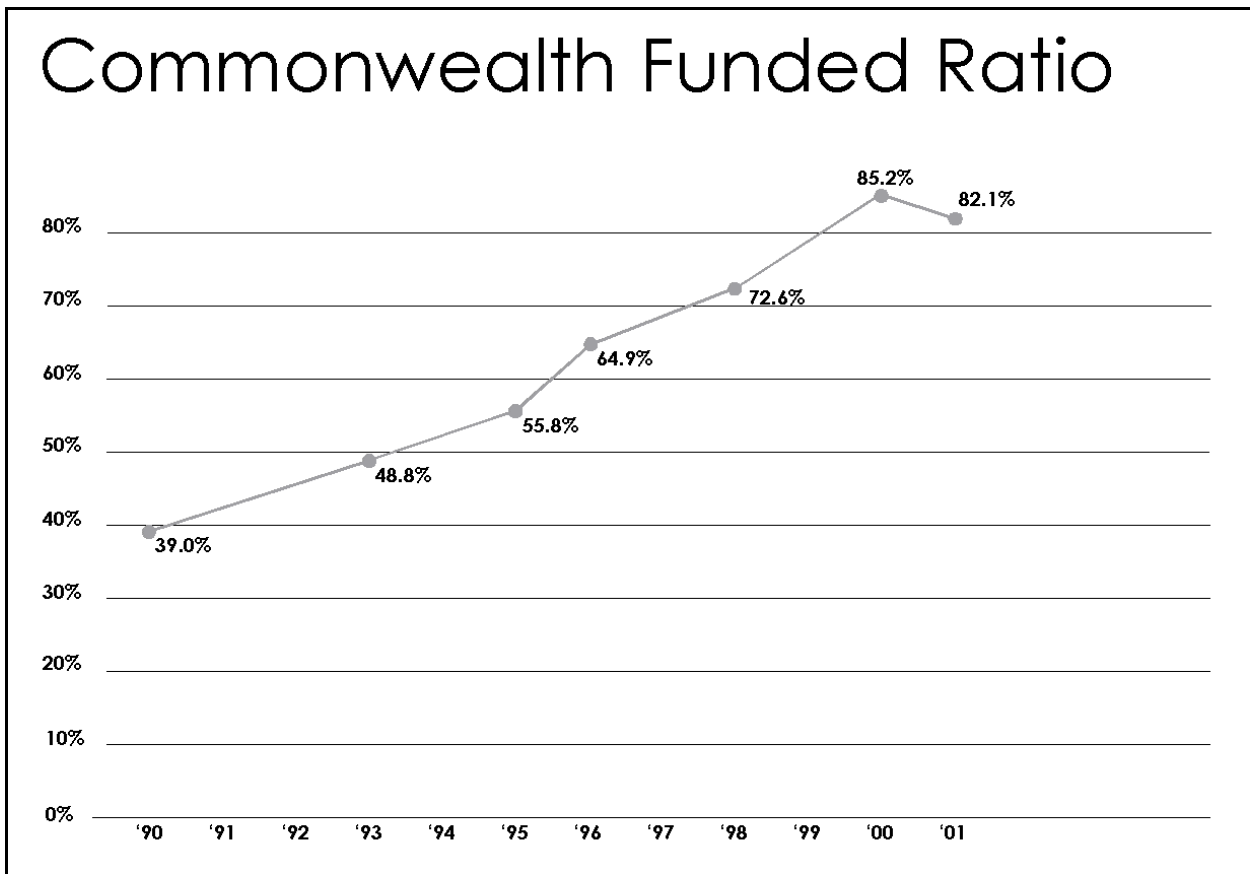
C. Funding Progress

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. In the January 1, 1998 actuarial valuation, we began implementing a methodology that averages realized and unrealized asset gains and losses over 5 years to reduce the potential volatility of the market value approach. 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. As of January 1, 2000, we used 91% of market value as the actuarial value of assets. With this valuation, the methodology has been completely phased-in.

If market value of assets were used in the January 1, 2001 valuation, the funded ratio would be 84.9%.





Commonwealth's Total Pension Obligation - 1/1/01

Section III  
Summary of Valuation Results

A. Number of Members on Current Valuation Date

	State Employees	State Teachers	Boston Teachers	Local COLA	Total
1. Active	87,118	86,798	5,571	N/A	179,487
2. Vested Terminated	2,775	N/A	115	N/A	2,890
3. Retired/ Beneficiaries	<u>44,027</u>	<u>32,631</u>	<u>2,426</u>	<u>N/A</u>	<u>79,084</u>
4. Total	<u>133,920</u>	<u>119,429</u>	<u>8,112</u>	N/A	261,461
B. Total Payroll (000's omitted)	\$3,700,410	\$4,072,062	\$303,977	N/A	\$8,076,449
C. Normal Cost (000's omitted)					
1. Superannuation	\$316,712	\$341,085	\$25,903		683,700
2. Termination	46,132	42,016	2,062		90,210
3. Disability	49,328	5,680	408		55,416
4. Death	<u>27,343</u>	<u>20,425</u>	<u>1,468</u>		<u>49,236</u>
Total Normal Cost	\$439,515	\$409,206	\$29,841		\$878,562
Employee Contribution	<u>289,481</u>	<u>313,168</u>	<u>21,526</u>		<u>624,175</u>
Net Employer Normal Cost	<u><b>\$150,034</b></u>	<u><b>\$96,038</b></u>	<u><b>\$8,315</b></u>	N/A	<u><b>\$254,387</b></u>

D. Actuarial Liability (000's omitted)

1. Active					
a. Superannuation	\$8,006,116	\$11,358,052	\$950,838		20,315,006
b. Termination	205,291	155,677	14,473		375,441
c. Disability	210,759	56,864	4,467		272,090
d. Death	<u>209,456</u>	<u>194,318</u>	<u>15,659</u>		<u>419,433</u>
Total Actives	\$8,631,622	\$11,764,911	\$985,437		\$21,381,970
Vested Terminated Members (a)	266,170	200,000	5,545		471,715
Non-Vested Terminated Members	65,152	N/A	8,848		74,000
Retirees and Survivors	<u>6,206,722</u>	<u>6,204,772</u>	<u>501,928</u>	<u>\$764,000</u>	<u>13,677,422</u>
Total Actuarial Liability	\$15,169,666	\$18,169,683	\$1,501,758	\$764,000	\$35,605,107
Assets (Actuarial Value) (b)	<u>13,921,533</u>	<u>14,390,340</u>	<u>918,373</u>	<u>0</u>	<u>29,230,246</u>
Unfunded Actuarial Liability	<u><b>\$1,248,133</b></u>	<u><b>\$3,779,343</b></u>	<u><b>\$583,385</b></u>	<u><b>\$764,000</b></u>	<u><b>\$6,374,861</b></u>
Funded Ratio (Ratio of Assets to Actuarial Liability) (c)	91.8%	79.2%	61.2%	0.0%	82.1%

(a) Total inactive liability (including non-vested terminated members) for State Teachers estimated to be \$200 million.

(b) Assumes 29.9% of Boston Retirement System assets allocated to Boston Teachers.

(c) If only annuity savings and annuity reserve funds are included in Boston Teacher assets, total funded ratio would be 80.4%.

Commonwealth's Total Pension Obligation - 1/1/01

Section IV  
Development of the Actuarial Gain or Loss  
(\$000,000's omitted)

	State	Teachers	Boston Teachers	Local COLA	Total
1. Unfunded Actuarial Liability (UAL) 1/00	773	2,739	521	803	4,836
2. Employer Normal Cost	215	163	13	0	391
3. Interest on (1) and (2) at 8.25%	81	239	44	66	431
4. Allocation of appropriation paid during 2000	375	469	51	96	991
5. Interest on (4) assuming mid year payment	15	19	2	4	41
6. Expected UAL 1/01: (1)+(2)+(3)-(4)-(5)	679	2,653	525	769	4,626
7. Increase/decrease in UAL due to revised assumptions	90	666	55	0	811
8. Expected UAL 1/01 after adjustments: (6)+(7)	769	3,319	580	769	5,437
9. UAL 1/1/01	1,248	3,779	583	763	6,373
10. Total gain/(loss): (8)-(9)	(479)	(460)	(3)	6	(936)

Section V  
Information Required by Auditors

A. Overview

In November of 1994, GASB issued Statements No. 25, 26 and 27, relating to Financial Reporting and Accounting for Pension Plans. We have included in this report the actuarial information required by Statement No. 27. The Commonwealth of Massachusetts chose to begin implementing Statement No. 27 for the reporting year Fiscal 1996.

Under GASB Statement No. 27, the calculation of an Annual Required Contribution (ARC) is required for each year. This calculation is to be based upon 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 FY00 to FY01. For FY01 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 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 0. No assets are attributed to the local COLA.

## Commonwealth's Total Pension Obligation - 1/1/01

Section VB. GASB Statement No. 27 (\$000's omitted)

	<u>State</u>	<u>Teachers</u>	<u>Boston Teachers</u>	<u>COLA</u>	<u>Total</u>
1. Annual Required Contribution (ARC) for FY01					
a. Normal Cost	150,034	96,038	8,315	0	254,387
b. Amortization Cost	125,170	379,015	58,505	76,618	639,309
c. ARC: (a) + (b)	275,204	475,053	66,820	76,618	893,696
2. Amount under (over) funded from prior year (NPO)	(1,330,071)	(951,489)	18,697	0	(2,262,862)
3. Interest on NPO	(109,731)	(78,498)	1,542	0	(186,686)
4. Amortization of NPO	(133,387)	(95,421)	1,875	0	(226,933)
5. Pension Cost: (1c) + (3) – (4)	298,861	491,976	66,488	76,619	933,943
6. Actual Contribution *	320,381	539,000	86,000	76,619	1,022,000
7. (5) – (6)	(21,520)	(47,024)	(19,512)	0	(88,057)
8. Net Pension Obligation/(Asset): (2)+(7)	(1,351,592)	(998,513)	(815)	0	(2,350,920)

\* estimated

Commonwealth's Total Pension Obligation - 1/1/01

Section VI  
Assets  
(000's omitted)

A. Breakdown of Assets

	State	Teachers
Investment in the Pension Reserve		
Investment Trust		
Market value	\$14,385,683	\$14,920,610
Actuarial value	\$13,921,533	\$14,390,340

B. Assets for Boston Teachers

For Boston Teachers, we assumed that the market value portion of total assets is allocated in the same proportion as shown in the January 1, 1994 actuarial valuation report for the City of Boston, performed by PERA. Assets were allocated to the teachers in the same proportion as the teachers accrued liability was in relation to the system's total accrued liability.

Total City of Boston assets	\$3,178,527
Market Value	
Assets allocated to Boston Teachers (29.91%)	
Market value	\$950,697
Actuarial value (96.6% of market value)	\$918,373

Commonwealth's Total Pension Obligation - 1/1/01

Section VI  
Assets  
(000's omitted)

C. Development of Actuarial Value of Assets for State and State Teachers

	<u>State</u>	<u>Teachers</u>	<u>Total</u>
A. Development of 12/31/00 expected actuarial value			
1. Market value 12/31/99	14,686,203	15,034,188	29,720,391
2. Actuarial value 12/31/99 (as calculated)	12,493,033	12,792,262	25,285,295
3. Employee contributions 2000 (est.)	273,714	282,671	556,385
4. Employer contributions 2000 (est.)	383,000	477,000	860,000
5. Benefit payments 2000 (est.)	(650,000)	(640,000)	(1,290,000)
6. Expected Investment return on (2): .0825 x (2)	1,030,675	1,055,362	2,086,037
7. Expected Investment return on (3)+(4)+(5): $\frac{1}{2} \times .0825 \times [(3) + (4) + (5)]$	277	4,936	5,213
8. Expected AVA 12/31/00: (2)+(3)+(4)+(5)+(6)+(7)	13,530,699	13,972,231	27,502,930
B. Previous differences not yet amortized			
1. Unrecognized amount of 12/31/99 difference:			
a. .4 x 1997 gain	292,712	317,071	609,783
b. .6 x 1998 gain	444,001	444,817	888,817
c. .8 x 1999 gain	<u>1,456,457</u>	<u>1,480,039</u>	<u>2,936,497</u>
c. Total	2,193,170	2,241,927	4,435,097
C. Gain/(loss) from 2000			
1. Market value 12/31/00	14,385,684	14,920,610	29,306,294
2. Expected market value 12/31/00: A(8)+B(1d)	15,723,869	16,214,158	31,938,028
3. Gain/ (loss) from 2000 investment: (1)-(2)	(1,338,185)	(1,293,548)	(2,631,734)
D. Development of AVA 12/31/00			
1. 2000 gain	(1,338,185)	(1,293,548)	(2,631,734)
2. 1999 gain	1,820,572	1,850,049	3,670,621
3. 1998 gain	740,001	741,361	1,481,362
4. 1997 gain	731,780	792,676	1,524,456
5. 20% of 2000 g/(l)	(267,637)	(258,710)	(526,347)
6. 20% of 1999 g/(l)	364,114	370,010	734,124
7. 20% of 1998 g/(l)	148,000	148,272	296,272
8. 20% of 1997 g/(l)	146,356	158,535	304,891
9. Total	390,834	418,108	808,941
10. Actuarial value 12/31/00: A(8)+D(9)	13,921,533	14,390,340	28,311,871
11. % of Market Value	96.8%	96.4%	96.6%

Commonwealth's Total Pension Obligation - 1/1/01

Section VII  
Information on System Membership

A - State Employees

A critical element of an actuarial valuation is accurate and up-to-date membership information which is provided by the Retirement Board. As part of this valuation, PERAC analyzed actual member information submitted as of 12/31/00 by the State Board of Retirement.

State Active Members

	<u>Actives</u>	<u>Vested Terminated</u>
Number of Members	87,118	2,775
Average Age	44.9	48.2
Average Service	12.0	15.5
Average Salary	\$42,476	\$41,628
Average Annuity Savings Fund Balance	\$33,757	\$44,084

Age by Service Distribution of Active Members

<i>Present</i> Age	Years of Service							Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 +	
0-24	2,514	13						2,527
25-29	5,529	931	41					6,501
30-34	5,028	2,934	1,525	92				9,579
35-39	3,712	2,496	3,322	1,610	122			11,262
40-44	3,344	2,251	2,931	2,985	1,385	64		12,960
45-49	2,994	1,941	2,526	2,650	2,626	981	119	13,837
50-54	2,209	1,686	2,205	2,210	2,221	1,953	1,138	13,622
55-59	1,184	1,031	1,542	1,579	1,393	1,182	1,590	9,501
60-64	487	567	757	846	750	587	898	4,892
65 +	172	227	390	430	402	306	510	2,437
Total	27,173	14,077	15,239	12,402	8,899	5,073	4,255	87,118

Commonwealth's Total Pension Obligation - 1/1/01

Section VII  
Information on System Membership (Continued)

State Active Members (continued)

Salary by Age Distribution of Active Members

<i>Present Age</i>	<i>Number of Participants</i>	<i>Total Salary</i>	<i>Average Salary</i>
0 - 24	2,527	\$60,311,909	\$23,867
25 - 29	6,501	\$206,880,400	\$31,823
30 - 34	9,579	\$361,833,309	\$37,774
35 - 39	11,262	\$454,029,864	\$40,315
40 - 44	12,960	\$543,498,174	\$41,937
45 - 49	13,837	\$621,534,840	\$44,918
50 - 54	13,622	\$644,534,850	\$47,316
55 - 59	9,501	\$454,185,625	\$47,804
60 - 64	4,892	\$235,721,193	\$48,185
65 +	2,437	\$117,879,882	\$48,371
Total	87,118	\$3,700,410,046	\$42,476



Commonwealth's Total Pension Obligation - 1/1/01  
Section VII  
Information on System Membership (Continued)

State Retirees and Survivors

	<i>Superannuation</i>	<i>Acc Dis</i>	<i>Ord Dis</i>	<i>Survivors</i>	Total
Number of Members	34,324	2,477	741	6,485	44,027
Average Age	72.8	62.8	66.5	73.3	72.2
Avg. Annual Benefit	\$16,319	\$22,452	\$12,737	\$8,448	\$15,445
	<u>Benefit by Payment and Retirement Type</u>				
Annuity	\$88,160,992	\$2,498,763	\$976,151	\$7,126,120	\$98,762,026
Pension	\$471,979,850	\$53,114,225	\$8,461,741	\$47,660,643	\$581,216,459
Total	\$560,140,842	\$55,612,988	\$9,437,892	\$54,786,763	\$679,978,485

Section VII  
Information on System Membership (Continued)

State Retirees and Survivors (continued)Benefit by Age Distribution

<i>Present Age</i>	<i>Number of Members</i>	<i>Total Benefits</i>	<i>Average Benefits</i>
less than 40	195	\$3,699,567	\$18,972
40 - 44	325	\$5,545,230	\$17,062
45 - 49	749	\$13,008,113	\$17,367
50 - 54	1,573	\$29,309,992	\$18,633
55 - 59	2,679	\$46,964,860	\$17,531
60 - 64	4,392	\$82,147,556	\$18,704
65 - 69	7,121	\$134,720,188	\$18,919
70 - 74	8,516	\$147,728,788	\$17,347
75 - 79	8,153	\$115,189,845	\$14,129
80 - 84	5,847	\$62,352,334	\$10,664
85 - 89	3,061	\$27,219,896	\$8,892
90 +	1,416	\$12,092,116	\$8,540
Total	44,027	\$679,978,485	\$15,445

Section VII

Information on System Membership

B - Massachusetts Teachers

A critical element of an actuarial valuation is accurate and up-to-date membership information which is provided by the Retirement Board. As a part of this valuation, PERAC analyzed actual member information submitted as of 12/31/00 by the Teachers' Retirement Board (TRB).

Teachers' Active Members

We made several assumptions with regard to 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 TRB indicated that this date of hire represents the original date of hire/membership with the Teachers' System. To the extent there are members with breaks in service, this methodology will overstate the plan's liability. For member data 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.

We also reviewed whether reported pay was reasonable for all members with reported pay greater than \$95,000. Pay for all members hired after January 1, 2000 was assumed to be \$40,000 or \$50,000 depending on age unless otherwise provided by TRB.

Members with pay less than \$5,000 were assumed to be inactive unless additional information was specifically requested and provided and these members were shown to be active. Other adjustments were made for members with reported pay between \$5,000 and \$15,000 depending on status code, employment date, ASF balance, and refund amounts.

We could not determine the number of vested terminations and instead estimated a combined inactive (terminated vested plus terminated with an ASF balance) liability.

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 Teachers' system, are conservative and likely 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.

Section VII  
Information on System Membership

Teachers' Active Members (continued)

	<u>Actives</u>
Number of Members	86,798
Average Age	45.1
Average Service	15.5
Average Salary	\$46,914
Average Annuity Savings	
Fund Balance	\$37,873

Age by Service Distribution of Teacher Active Members

Years of Service

<i>Present</i> Age	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 +	Total
0-24	2,308	1						2,309
25-29	7,932	1,123	3					9,058
30-34	5,322	3,526	485	6				9,339
35-39	2,785	1,702	1,929	428	1			6,845
40-44	2,886	1,503	1,639	1,737	868	12		8,645
45-49	2,713	1,759	1,719	1,389	4,041	3,178	7	14,806
50-54	1,675	1,309	1,657	1,019	1,648	7,299	5,650	20,257
55-59	590	439	705	522	674	1,450	7,377	11,757
60-64	140	108	204	185	247	419	1,894	3,197
65 +	31	16	42	40	55	89	312	585
Total	26,382	11,486	8,383	5,326	7,534	12,447	15,240	86,798

Section VII  
Information on System Membership (Continued)

Teachers' Active Members (continued)Salary by Age Distribution of Teacher Active Members

<i>Present Age</i>	<i>Number of Participants</i>	<i>Total Salary</i>	<i>Average Salary</i>
0 - 24	2,309	\$82,979,123	\$35,937
25 - 29	9,058	\$320,492,520	\$35,382
30 - 34	9,339	\$355,478,899	\$38,064
35 - 39	6,845	\$288,783,716	\$42,189
40 - 44	8,645	\$381,749,615	\$44,158
45 - 49	14,806	\$713,933,360	\$48,219
50 - 54	20,257	\$1,070,112,922	\$52,827
55 - 59	11,757	\$647,951,894	\$55,112
60 - 64	3,197	\$178,180,219	\$55,734
65 +	585	\$32,399,843	\$55,384
<b>Total</b>	<b>86,798</b>	<b>\$4,072,062,110</b>	<b>\$46,914</b>

Commonwealth's Total Pension Obligation - 1/1/01

Section VII  
Information on System Membership (Continued)

Teachers' Retirees and Survivors

	<i>Superannuation</i>	<i>Acc Dis</i>	<i>Ord Dis</i>	<i>Survivors</i>	<b>Total</b>
Number of Members	28,835	285	488	3,023	32,631
Average Age	71.9	65.1	65.4	68.7	71.5
Avg. Annual Benefit	\$22,251	\$26,092	\$15,471	\$9,604	\$21,012
	<u>Benefit by Payment and Retirement Type</u>				
Annuity	\$31,990,294	\$85,212	\$193,002	\$923,541	\$33,192,049
Pension	\$609,625,390	\$7,350,918	\$7,356,790	\$28,108,496	\$652,441,594
Total	\$641,615,684	\$7,436,130	\$7,549,792	\$29,032,037	\$685,633,643

Section VII  
Information on System Membership (Continued)

Teachers' Retirees and Survivors (continued)Benefit by Age Distribution

<i>Present Age</i>	<i>Number of Members</i>	<i>Total Benefits</i>	<i>Average Benefits</i>
less than 40	210	\$1,382,350	\$6,583
40 - 44	21	\$134,934	\$6,425
45 - 49	141	\$1,708,766	\$12,119
50 - 54	788	\$11,606,916	\$14,730
55 - 59	2,226	\$43,402,135	\$19,498
60 - 64	5,371	\$148,645,407	\$27,676
65 - 69	6,803	\$180,488,301	\$26,531
70 - 74	6,073	\$131,743,958	\$21,693
75 - 79	4,370	\$76,089,060	\$17,412
80 - 84	2,989	\$42,887,542	\$14,348
85 - 89	2,026	\$26,839,490	\$13,248
90 +	1,613	\$20,704,784	\$12,836
Totals	32,631	\$685,633,643	\$21,012

Section VII  
Information on System Membership (Continued)

C - Boston Teachers

A critical element of an actuarial valuation is accurate and up-to-date membership information which is provided by the Retirement Board. As part of this valuation, PERAC analyzed actual member information submitted as of 12/31/00 by the Boston Board of Retirement.

Boston Teachers- Active Members

	<u>Actives</u>	<u>Vested Terminated</u>
Number of Members	5,571	115
Average Age	47.2	44.1
Average Service	17.6	13.3
Average Salary	\$54,564	\$32,941
Average Annuity Savings Fund Balance	\$45,366	\$19,377

Terminated vested members were not coded as such. We estimated the number of terminated vested members based on credited service.

Age by Service Distribution of Boston Teacher Active Members

Years of Service

<i>Present Age</i>								Total
	<i>0 - 4</i>	<i>5 - 9</i>	<i>10 - 14</i>	<i>15 - 19</i>	<i>20 - 24</i>	<i>25 - 29</i>	<i>30 +</i>	
0-24	136	3						139
25-29	296	76	13					385
30-34	99	259	76	10				444
35-39	63	137	175	50	1			426
40-44	53	97	152	198	38	1		539
45-49	46	103	186	203	231	161	2	932
50-54	38	84	140	278	101	380	363	1,384
55-59	27	31	90	107	64	101	496	916
60-64	11	22	28	41	24	40	144	310
65 +	2	3	10	11	14	16	40	96
Total	771	815	870	898	473	699	1,045	5,571



Section VII  
Information on System Membership (Continued)

Boston Teachers- Active Members (continued)

Salary by Age Distribution of Boston Teacher Active Members

<i>Present Age</i>	<i>Number of Participants</i>	<i>Total Salary</i>	<i>Average Salary</i>
0 - 24	139	\$4,459,147	\$32,080
25 - 29	385	\$13,479,909	\$35,013
30 - 34	444	\$20,125,486	\$45,328
35 - 39	426	\$21,093,939	\$49,516
40 - 44	539	\$28,332,453	\$52,565
45 - 49	932	\$53,508,873	\$57,413
50 - 54	1,384	\$83,608,422	\$60,411
55 - 59	916	\$56,046,127	\$61,186
60 - 64	310	\$18,945,235	\$61,114
65 +	96	\$5,818,791	\$60,612
Total	5,571	\$305,418,383	\$54,823

Commonwealth's Total Pension Obligation - 1/1/01

Section VII  
Information on System Membership (Continued)

Boston Teachers- Retirees and Survivors

Retirees and Survivors

	<i>Superannuation</i>	<i>Acc Dis</i>	<i>Ord Dis</i>	<i>Survivors</i>	Total
Number of Members	2,081	60	45	240	2,426
Average Age	73.6	68.8	63.6	73.0	73.2
Avg. Annual Benefit	\$25,763	\$23,777	\$16,394	\$11,322	\$24,112
	<u>Benefit by Payment and Retirement Type</u>				
Annuity	\$1,701,761	\$22,356	\$26,465	\$49,295	\$1,799,877
Pension	\$51,911,828	\$1,404,257	\$711,283	\$2,667,901	\$56,695,269
TOTAL	\$53,613,589	\$1,426,613	\$737,748	\$2,717,196	\$58,495,146

Section VII  
Information on System Membership (Continued)

Boston Teachers- Retirees and Survivors (continued)Benefit by Age Distribution

<i>Present Age</i>	<i>Number of Members</i>	<i>Total Benefits</i>	<i>Average Benefits</i>
less than 40	7	\$66,403	\$9,486
40 – 44	1	\$15,770	\$15,770
45 – 49	16	\$158,976	\$9,936
50 – 54	53	\$831,021	\$15,680
55 – 59	144	\$2,964,101	\$20,584
60 – 64	326	\$10,164,013	\$31,178
65 – 69	420	\$12,935,077	\$30,798
70 – 74	478	\$12,844,947	\$26,872
75 – 79	357	\$8,175,548	\$22,901
80 – 84	262	\$4,683,572	\$17,876
85 – 89	162	\$2,650,801	\$16,363
90 +	200	\$3,004,917	\$15,025
Totals	2,426	\$58,495,146	\$24,112

Section VIII  
Valuation Cost Methods

A Actuarial Cost Method

The Actuarial Cost Method which was used to determine pension liabilities and costs for benefits payable under the State Employees' Contributory Retirement System, the Massachusetts Teachers' Retirement System, and for the Boston Teachers, for the year beginning January 1, 2001, 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 member first became a member of the retirement system, would fully fund by retirement, death, disability or termination, the projected benefits which the participant 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 minus current assets.

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

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

B Asset Valuation Method

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. With this valuation the methodology has been completely phased in. The actuarial value of assets as of January 1, 2001 is 96.6% of the market value.

Section IX  
Actuarial Assumptions

***Investment Return*** 8.25% per year

***Interest Rate credited to the Annuity Savings Fund*** 4.5% per year

***Assumed rate of 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 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%

Commonwealth's Total Pension Obligation - 1/1/01

Section IX  
Actuarial Assumptions (Continued)

***Retirement***

Age	Group 1		Group 2	Group 3	Group 4	Male Teachers		Female Teachers	
	Male	Female				Service		Service	
						<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

Section IX  
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 also 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

Commonwealth's Total Pension Obligation - 1/1/01

Section IX  
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



Section X  
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 one retirement law, Chapter 32 of the Massachusetts General Laws. This law in general provides uniform benefits, uniform contribution requirements and a uniform accounting and funds structure for all systems.

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

There are 4 classes of membership in the State Retirement System:

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, state correction officers and other hazardous positions specified in the statute.

**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)

1979 to present - an additional 2% of regular compensation in excess of \$30,000.

**RATE OF INTEREST** : Regular 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.

Section X  
Summary Of Plan Provisions (Continued)

**RETIREMENT AGE**: There is no mandatory retirement age for most employees. Certain public safety personnel are required to retire at age 65. Mandatory retirement age for state police officers is age 55, but the Commonwealth has been enjoined from enforcing this provision in conjunction with ongoing litigation.

Members over the age of 70 may elect to continue making contributions on regular compensation and continue to accrue additional years of creditable service.

**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 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 employees' highest three year average salary (75% for Group 3 members). For veterans as defined in G.L. c. 32, s. 1, there is an additional benefit of \$15 per year for each year of 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 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 members who terminate from service under age 55, the benefit rate for a Group 1 member shall be used.

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

Section X  
Summary Of Plan Provisions (Continued)

**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.

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

Ordinary Disability:

Eligibility: Non-veterans who become totally and permanently disabled by reason of a non-job related condition with at least 10 years of creditable service.

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 or she will not receive less than the superannuation allowance to which he or she is entitled.

Accidental Disability:

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

Section X  
Summary Of Plan Provisions (Continued)

Retirement Allowance: 72% of salary plus an annuity based on accumulated member contributions, with interest. This amount is not to exceed 100% of pay (75% for members hired after 1987). There is an additional pension of \$543.12 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 department 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 may receive a one time payment of \$100,000.00 from the State Retirement Board.

**DEATH AFTER ACCIDENTAL DISABILITY RETIREMENT**

Effective November 7, 1996, Accidental Disability retirees were allowed to select Option C at retirement and provide a benefit for an eligible survivor. For Accidental Disability retirees prior to November 7, 1996, who could not select Option C, if the member's death is from a cause unrelated to the condition for which the member received accidental disability benefits, a surviving spouse will receive an annual allowance of \$6,000.

Section X  
Summary Of Plan Provisions (Continued)

**DEATH IN ACTIVE SERVICE :**

Eligibility: At least 2 years of service

Allowance: An 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 a full time student, 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. Each year PERAC submits to the legislature the percentage increase in the Consumer Price Index used for indexing Social Security benefits. This benefit is subject to an annual vote of the Massachusetts General Court, but cannot exceed 3.0%.

**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.

Section X  
Summary Of Plan Provisions (Continued)

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 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.

Section XI  
Glossary of Terms

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

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

**ACTUARIAL COST METHOD (or FUNDING METHOD)** A procedure for allocating the Actuarial Present Value of all past and future pension plan benefits to the Normal Cost and the Actuarial Accrued Liability.

**ACTUARIAL GAIN OR LOSS (or EXPERIENCE GAIN or LOSS)** A measure of the difference between actual experience and that expected based upon the set of Actuarial Assumptions, during the period between two Actuarial Valuation dates.

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

**ACTUARIAL PRESENT VALUE** The dollar value on the valuation date of all benefits expected to be paid to current members based upon the Actuarial Assumptions and the terms of the Plan.

**AMORTIZATION PAYMENT** That portion of the pension plan appropriation which represents payments made to pay interest on and the reduction of the Unfunded Accrued Liability.

**ANNUAL STATEMENT** The statement submitted to PERA each year that describes the asset holdings and Fund balances as of December 31 and the transactions during the calendar year that affected the financial condition of the retirement system.

**ANNUITY RESERVE FUND** The fund into which total accumulated deductions, including interest, is transferred at the time a member retires, and from which annuity payments are made.

**ANNUITY SAVINGS FUND** The fund in which employee contributions plus interest credited are held for active members and for former members who have not withdrawn their contributions and are not yet receiving a benefit (inactive members).

Section XI  
Glossary of Terms (Continued)

**ASSETS** The value of securities as described in Section VIII.

**COST OF BENEFITS** The estimated payment from the pension system for benefits for the fiscal year. This is the minimum amount payable during the first six years of some Funding Schedules.

**EXPENSE FUND** The fund into which the appropriation for administrative expenses is paid and from which all such expenses are paid.

**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

**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 BENEFIT OBLIGATION** The portion of the Actuarial Present Value attributable to past service in accordance with the Projected Unit Credit cost method as stipulated by GASB Statement Number 5.

**PENSION FUND** The fund into which appropriation amounts as determined by PERA are paid and from which pension benefits are paid.

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

**SPECIAL FUND FOR MILITARY SERVICE CREDIT** The fund which is credited with amounts paid by the Commonwealth equal to the amount which would have been contributed by a member during a military leave of absence as if the member had remained in active service of the Commonwealth. 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.