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**THE COMMONWEALTH OF MASSACHUSETTS**  
**JANUARY, 1983**

**Actuarial Study of the Impact of  
Cost-of-Living Increases to Retired Members  
of the  
Contributory Retirement Systems  
of the Commonwealth of Massachusetts  
to take effect on  
July 1, 1983**

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**Retirement Law Commission**

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ACTUARIAL STUDY OF THE IMPACT OF  
COST-OF-LIVING INCREASES TO RETIRED MEMBERS  
OF THE  
CONTRIBUTORY RETIREMENT SYSTEMS  
OF THE COMMONWEALTH OF MASSACHUSETTS  
TO TAKE EFFECT ON  
JULY 1, 1983

Prepared by:

The Massachusetts Retirement Law Commission  
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January, 1983

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## SECTION 1 - INTRODUCTION

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The Massachusetts Retirement Law Commission was requested by the executive and legislative branches of government to study the financial effect of granting cost-of-living increases as of July 1, 1983 to all eligible retired members and beneficiaries of the Contributory Retirement Systems of the Commonwealth of Massachusetts.

With the passage of Proposition 2-1/2, any pension increases granted by the legislature for public employees of the Commonwealth must be funded entirely within the state budget. For Fiscal 1981-82 and for Fiscal 1982-83, the cost of a 3% pension increase was funded entirely within the state budget to include retirees of all state, county and municipal systems.

This report presents an actuarial analysis of the effect of a 3%, 4% or 5% cost-of-living increase as of July 1, 1983. The analysis includes the cost of making these additional pension payments during the 1984 Fiscal Year and also measures the additional liability to the Commonwealth when the increases granted as of July 1, 1983 are made a permanent part of the retirement allowance to be paid in future years to the affected retired members.

Section 2 analyzes the pay-as-you-go cost of such increases in the 1984 Fiscal Year.

Section 3 presents the additional liability incurred when such increases are made a permanent part of the retirement allowances.

Section 4 sets forth the data used in the calculations and the procedures used to project such information to a current date.

It should be noted that the most recent complete data on retired members is the data collected for the January 1, 1979 actuarial valuation. The studies made to determine the financial impact of cost-of-living increases in 1981 and 1982, as well as this study, were made by projecting January 1, 1979 data using Annuity Reserve reports for more recent years. It is recommended that up-to-date data on retired members be collected in order to insure greater accuracy of future studies of this type.

The undersigned is available to answer any questions or provide additional information with respect to this report.

January 17, 1983  
Date Signed

Carmen W. Elio  
Carmen W. Elio  
Chairman

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SECTION 2 - PAY-AS-YOU-GO COST FOR 1984 FISCAL YEAR

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This section analyzes the additional payments to be made to all retired members, included in the 101 Contributory Retirement Systems in the Fiscal Year ending June 30, 1984, entitled to a cost-of-living increase in accordance with Chapter 32 of the General Laws.

The estimated amount of additional pension which would be paid out to eligible retired members and beneficiaries for the period July 1, 1983 through June 30, 1984, assuming a cost-of-living increase of 3%, 4% or 5% effective July 1, 1983, is as follows:

	Cost-of-Living Increase of:		
	3%	4%	5%
State Employees	\$ 4,149,922	\$ 5,533,229	\$ 6,916,536
Teachers	3,367,523	4,490,031	5,612,538
County Boards	1,330,282	1,773,709	2,217,136
City of Boston	1,994,194	2,658,925	3,323,656
All Other Local Boards	4,117,374	5,489,832	6,862,290
Total	\$14,959,295	\$19,945,726	\$24,932,156

Looking only at those increases granted beginning in 1981 when the state began funding the cost-of-living increases for the local boards, the cumulative effect of the increases in 1981 and 1982, combined with the proposed increase for 1983 at 3%, 4% or 5%, is estimated to be as follows for the 1984 Fiscal Year:

<u>July 1, 1983 Increase of</u>	<u>Total Payment to be made in Fiscal 1984</u>		
	<u>State Employees, Teachers</u>	<u>All Local Boards</u>	<u>Total*</u>
3%	\$20,509,024	\$20,127,626	\$40,636,650
4%	23,014,839	22,608,242	45,623,081
5%	25,520,653	25,088,858	50,609,511

Of the totals shown above, the amounts for the State Employees and Teachers have always been the responsibility of the Commonwealth, whereas the amounts for the local boards had previously been the responsibility of the local communities.

The next section will analyze the additional unfunded liability associated with such increases.

\* The figures in this column represent total payments accruing as the result of cost-of-living increases since the inception of Proposition 2-1/2 and do not equal the dollar value of the line item budgetary appropriation necessary to fund cost-of-living increases through Fiscal 1984. This discrepancy occurs because prior year cost-of-living increases accruing to State Employees and Teachers are rolled over into the pension base for those Boards and appear in the budget document as part of the main pension account appropriation requests of those agencies. The actual line item appropriation for Fiscal 1984 assuming Fiscal 1984 cost-of-living increases of 3%, 4%, and 5% are as follows:

<u>July 1, 1983 Increase of</u>	<u>State Employees, Teachers</u>	<u>All Local Boards</u>	<u>Total</u>
3%	\$ 7,517,445	\$20,127,626	\$27,645,071
4%	10,023,260	22,608,242	32,631,502
5%	12,529,074	25,088,858	37,617,932

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### SECTION 3 - ADDITIONAL UNFUNDED LIABILITY

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Section 2 measured just the additional amount of pension payments which would be made during the 1984 Fiscal Year if certain cost-of-living increases were put into effect.

When cost-of-living increases are granted, increases are made a permanent part of the retired members' pensions. This means that at the time such increases are granted, the commitment is made to pay increases not only for the current fiscal year but for all the remaining years of the retired members' lives. In effect, an additional unfunded liability is incurred by each retirement system equal to the present value of all future cost-of-living payments for the expected lifetime of all affected members. For an average retired member, this would amount to approximately ten to eleven times the amount of a single year's payment.

Before 1981, this unfunded liability became a liability for the local government. Under present law, it becomes a liability of the state.

It should also be kept in mind that future cost-of-living increases will be applied to the current year's cost-of-living increase, since the current increase becomes a part of the base to which future increases apply. The following chart illustrates how a cost-of-living increase granted in the current year will increase with future cost-of-living increases. If it is assumed that the retired member was receiving a pension of \$4,000 and receives a 3% cost-of-living increase each year for a 15-year life expectancy, the result would be:

<u>Fiscal Year</u>	<u>Total Pension</u>	<u>Value of Fiscal 1984 Increase</u>
1984	\$4,120.00	\$ 120.00
1985	4,243.60	123.60
1986	4,370.91	127.31
1987	4,502.04	131.13
1988	4,637.10	135.06
1989	4,776.21	139.11
1990	4,919.49	143.28
1991	5,067.07	147.58
1992	5,219.08	152.01
1993	5,375.65	156.57
1994	5,536.92	161.27
1995	5,703.03	166.11
1996	5,874.12	171.09
1997	6,060.34	176.22
1998	6,231.85	<u>181.51</u>
		\$2,231.85

The total of all payments made due to the 1984 increase is \$2,231.85.

Discounted at 7%, the value on July 1, 1983 is \$1,350.89.

The following represents the total additional unfunded liability incurred on July 1, 1983 for cost-of-living increases of 3%, 4% or 5% effective on that date:

	<u>Cost-of-Living Increase of:</u>		
	<u>3%</u>	<u>4%</u>	<u>5%</u>
State Employees	\$ 47,335,229	\$ 63,113,638	\$ 78,892,048
Teachers	34,635,913	46,181,218	57,726,522
County Boards	15,219,907	20,293,210	25,366,512
City of Boston	21,726,588	28,968,784	36,210,980
All Other Local Boards	<u>47,819,642</u>	<u>63,759,523</u>	<u>79,699,403</u>
Total	\$166,737,279	\$222,316,373	\$277,895,465



The total cumulative additional unfunded liability which will have been incurred by the cost-of-living increases granted in 1981 and 1982, combined with the unfunded liability associated with the proposed increases for 1983 of 3%, 4% or 5%, is as follows:

<u>1983 Increase of</u>	<u>Total Unfunded Liability Added by 1981, 1982 and 1983 Increases</u>		
	<u>State Employees, Teachers</u>	<u>All Local Boards</u>	<u>Total</u>
3%	\$227,673,777	\$230,599,885	\$458,273,662
4%	254,997,491	258,855,265	513,852,756
5%	282,321,205	287,110,643	569,431,848

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SECTION 4 - SOURCE OF DATA

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Data on all retired members and beneficiaries was available from actuarial valuation data as of January 1, 1979 for all boards which submitted such data to the Commission. For those boards for which no data was submitted for the actuarial valuation, annuity reserve data was used with the assumption that the total retirement allowance was ten times the amount of the annuity portion. This relationship was derived from an analysis of the Annual Reports to the Division of Insurance.

The Retirement Law Commission is presently developing methods of collecting and maintaining an up-to-date data base which will insure the accuracy of future studies.

The allowances as of January 1, 1979 were projected to 1983 by:

1. Adjusting for cost-of-living increases granted in 1979, 1980, 1981 and 1982.
2. Adjusting for expected mortality between January 1, 1979 and July 1, 1983.
3. Adjusting for new retirements in 1979, 1980 and 1981 from statistics derived from a comparison of the Annuity Reserve data for December 31, 1978, December 31, 1980 and December 31, 1981.

Each individual retirement allowance was limited to \$7,000 annually before applying the cost-of-living percentage of 3%, 4% or 5%.

The additional unfunded liabilities were calculated using the actuarial assumptions outlined in the actuarial valuations of the systems.

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