COST OF LIVING ADJUSTMENT (COLA)

PUBLIC EMPLOYEE RETIREMENT ADMINISTRATION COMMISSION

ROBERT F. STALNAKER, Executive Director
December 30, 1997

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12/30/97

Chapter 17 of the Acts of 1997 which revised the manner in which Cost of Living Adjustments are granted to public pension retirees in the Commonwealth also directed the Public Employee Retirement Administration Commission (PERAC) to conduct a study of the costs associated with the implementation of that legislation. It is our pleasure to file this report which has also been filed with retirement boards, county commissioners, city councils, town meetings, and members of authorities and districts.

Review of Chapter 17

Pursuant to Chapter 17, PERAC's actuary is required to submit an annual report on or before March 1 to the Legislature on the computation of the increase in the Consumer Price Index by the Federal Commissioner of Social Security. The report must include a "statement that such an increase in the Consumer Price Index ... requires a cost of living increase... equal to the percentage increase in the Consumer Price Index or three per cent whichever is less."

The report will be considered by the Legislature and if the Legislature and the Governor approve a COLA, all eligible state and teacher members and beneficiaries will receive a COLA commencing on July 1 at the percentage approved.

If a city, town or county system accepts the provisions of section 103 of Chapter 32, the Commission must send the report and a copy of the state legislation to each such system on April 1 of each year. On an annual basis, if the retirement board votes to adopt the COLA recommended by the report, eligible members and beneficiaries of the system will receive a COLA commencing in July.

The provisions of Section 103 are accepted by vote of the retirement board subject to approval of the "legislative body". "Legislative body" is the town meeting in a town, city council in a city, county retirement board advisory council in a county, district members in a district and the governing body of an authority. A decision to accept cannot be revoked.

If the provisions of section 103 are accepted, the system in consultation with PERAC will establish a funding schedule designed to reduce the additional liability resulting from acceptance to zero by a date approved by PERAC.

Finally the proposal increases the base on which the COLA will be applied from $9,000 to $12,000.

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General Considerations

The appropriation for retirement pursuant to funding schedules is determined by the assumptions underlying the actuarial valuation on which the schedule is based and the methodology used in establishing the funding schedule. The retirement systems potentially impacted by the legislation are at different levels of fiscal security and employ a variety of assumptions and methodologies in funding schedules. Thus the impact will be unique to each system.

The issue centers not only on the total cost to each system but also on the ability of the governmental units to bear these costs. The answer to that question rests with the assumptions used in the valuation of each system and the methodology employed in developing each funding schedule. More importantly, the ability to bear these costs will depend on the present financial condition of each retirement system. The relationship between COLA costs and the appropriation amount is only one element of the retirement systems' experience in the period between the dates funding schedules are established. A funding schedule addresses the liabilities of the system at the date of the actuarial valuation. The valuation which estimates those liabilities is based on the benefit structure of the system at the time of the valuation. During the period in which unfunded liabilities are being amortized, the schedule is adjusted regularly to account for actual experience. A revision of a funding schedule incorporates all of the experience since the previous schedule and appropriations are driven by the total experience not merely one component such as the change in COLA responsibility.

In addition, the method used in addressing the liability created by acceptance of the legislation presents an opportunity to mitigate the budgetary impact. A significant number of the 104 local retirement systems are on either a level payment schedule or a variation of such a schedule. These systems are paying off existing liability at a faster rate than those on minimum schedules which allow for 4.5% annual increases in appropriations over a period ending in 2028. The majority of cities and towns are presently appropriating to the retirement system according to a schedule which provides flexibility in addressing the COLA liability. PERAC will work with all systems which accept the COLA option to balance the need for adequate retirement system funding with budgetary considerations.

The financial condition of the State Employees Retirement System (State) and the State Teachers' Retirement System (Teachers) will be affected by Chapter 17. The Commission intends to conduct an actuarial valuation of these systems as of 1/1/98 which will assess that impact as well as the cost consequences of the increased liability created by the transfer of a number of employees to the State system pursuant to legislation abolishing County Government.

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Actuarial Primer

In order to assess the financial impact of Chapter 17 it is necessary to review the funding history of our retirement systems and to discuss general principles related to actuarial valuations as well as funding of retirement systems. Shortly after World War II, the Massachusetts Public Pension System was created with the passage of Chapter 32 of the General Laws. The original statute mandated that benefits would be financed on a "pay as you go" basis, that is the appropriation to the systems by the governmental units would equal the cost of benefits to be paid in that year. For many years this resulted in a windfall for employers who paid less than would be necessary under actuarial funding of benefits. In its simplest form actuarial funding requires contributions into the system of an amount deemed sufficient on an actuarial basis to pay benefits to active employees when they retire. Those contributions are frequently a combination of employee and employer contributions. The actuarial term for these payments is "normal cost". Unfortunately, due to the "pay as you go" funding method the Massachusetts Retirement Systems accumulated significant unfunded liabilities resulting from the failure to fund active employee benefits as those benefits accrue (that is to pay "normal cost" for active employees). Funding reforms adopted in the 1980's resulted in the beginning of a transition to actuarially based financing for the Massachusetts systems. This requires that contributions be made which include "normal cost" or a payment to cover benefits accruing to active employees **plus** a payment to amortize or eliminate the unfunded liability created by the failure to make previous "normal cost" payments.

All Massachusetts Retirement Systems are presently receiving appropriations according to actuarial funding schedules which include "normal cost" and amortization of unfunded liability. In addition these schedules must also incorporate gains and losses resulting from the experience of the systems between actuarial valuations. An actuarial valuation estimates the future benefits to be paid to each member of the system. The overall valuation determines the impact of all these individual estimates. The projection of these benefits depends on various assumptions made about the future such as the rate of investment return or future salary increases. A gain is created when experience deviates from expectation in a manner which results in lower cost and a loss is created when experience deviates from expectation in a manner which results in higher cost.

The creation of gains and losses and the way those gains and losses impact the appropriations which must be made to the system is important in assessing the ability to finance the COLA.

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Systems Funding Progress

During the last decade the Massachusetts Retirement Systems have made substantial and in most cases unexpected progress in fiscal condition. Concurrent with the adoption of actuarially based funding, enhanced investment flexibility resulted in significant increases in the market value of assets. These “actuarial gains” have, in many instances, served to reduce contributions by employers or enabled the establishment of an aggressive funding schedule which retires the system’s unfunded liability at a faster pace than under the original funding schedule. The real measure of the COLA’s impact can only be assessed by recognizing that in general the systems are far ahead of expectations.

Several Massachusetts systems are fully funded as of the last date assets and liabilities were valued. Norwood,Wellesley, Minuteman, Blue Hills, Greater Lawrence Sanitary District, MassTurnpike, MassPort and MHFA are all 100% funded. Generally the more recent the actuarial valuation the better funded the system. This is logical as asset growth in 1995 and 1996 is reflected in the more recent valuations. In 1996 asset growth averaged 15.39% and in 1995 asset growth averaged 25.06%. This also provides guidance to systems as they contemplate COLA issues. The actuarial valuation reviews the totality of the system’s fiscal circumstances. The closer that valuation is to the date of the decision on whether to adopt Chapter 17, the more informed that decision. Consequently as this issue will be considered in the early part of 1998, valuations or valuation updates as of 1/1/98 will provide a clearer picture of the systems financial condition.

How PERAC Valued the COLA

All liabilities and costs have been assessed as of 1/1/97. FY 98 appropriations have assumed a payment date of 1/1/98. Ultimately, new funding schedules will be adjusted to reflect actual payment dates for each system. In addition, in order to provide a true comparison with existing funding schedules and to isolate the COLA impact, the FY 98 appropriation amount set forth in this study **does not** include an assumed amount for board expenses as required pursuant to recent statutory changes and PERAC MEMO 15/1997. Expenses are not affected by the adoption of the COLA.

In performing our valuations, PERAC consistently applied assumptions relative to future COLAs based on past experience in valuing the COLA costs at the state level. Specifically, it was assumed that a 3% COLA would be granted on $12,000 in each year. Although the likelihood of 3% annually may not seem realistic, it is difficult to develop a methodology which properly assesses how much of a variance can be expected. The result of either not granting a COLA or granting a COLA below 3% in any particular year creates an actuarial “gain” which will be reflected in the next revision of the system’s funding schedule.

The projected impact of the COLA has been integrated into the valuation of other system liabilities. As a result, the actuarial assumptions regarding investment return or payroll increase are the same as in the most recent valuation of overall liability. These assumptions are an important aspect of analyzing the liability of each system and must be reviewed for reasonableness in determining the impact of the COLA. Any funding alternatives which rely on changes in the assumptions must assure that such a change is well within acceptable actuarial practice.

Only by analyzing the COLA as part of the total package of system liabilities can a true picture of the consequences of its adoption be presented.

System Analysis

This report divides the retirement systems according to the source of the valuation which estimated the impact of the COLA. The first group consists of those systems which have worked with PERAC and their private actuary to develop acceptable funding schedules to address the impact of the COLA. In addition this group includes those systems which have integrated the COLA into past schedules. These total 8 systems. The second group consists of retirement systems PERAC valued in 1997 and, as part of that valuation, PERAC analyzed the impact of the COLA. Also included are systems valued by PERAC as of 1/1/96 (with COLA impact determined as of 1/1/96) and estimated as of 1/1/97. These total 33 systems. The third group of systems are those in which a valuation including the COLA has been conducted either as of 1/1/95, as of 1/1/96 or as of 1/1/97 by a private actuary. These total 18 retirement systems. The fourth group of systems are those which did not have a PERAC or a private valuation which analyzed the COLA. For this group, assumptions have been applied to bring the most recent valuation results forward to 1/1/97. The actual COLA results for other systems were used to establish estimates for these systems. These total 45 retirement systems. As a result, analysis has been completed on every retirement system.

Systems With Funding Schedules

PERAC has worked with the retirement boards in Milton, Natick, Boston and Lowell as well as their respective private actuaries in reviewing the impact of the COLA and the alternatives for addressing that impact as part of the establishment of a revised funding schedule for the total liabilities of the retirement system. It is in this context that a comprehensive approach to the issue of the COLA can result in a valid actuarial approach which is sensitive to the financial impact of COLA liabilities. In these cases the progress made in recent years in funding the other liabilities of the system created a window of opportunity for absorbing the cost of the COLA. Also, the Massachusetts Turnpike Authority Retirement System, Massachusetts Housing Finance Authority Retirement System, Massachusetts Water Resources Authority Retirement System, and the Massachusetts Port Authority (MassPort) Retirement System, have funding schedules in place which include the COLA as a responsibility of those systems.

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The following outlines the impact of the COLA on the total actuarial liability of these retirement systems. Due to the fact that the liability is not offset by any assets, the effect on the unfunded liability is identical to this increase.

System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Milton	$45,781,236	$50,059,755	$10,771,166	$15,049,685
Natick	$62,827,000	$69,065,000	$16,401,034	$22,639,034
Boston	$3,172,727,000	$3,457,450,000	$1,120,119,000	$1,404,842,000
Lowell	$195,998,599	$215,080,923	$88,334,796	$107,417,120

The impact of the COLA on the system's Funded Ratio (percentage of assets to liabilities) provides another perspective. It should be noted that the progress that systems have made over the past decade have resulted in ratios in excess of previous estimates. In fact, the Funded Ratio provides a more comprehensive short hand measure of COLA impact because it incorporates all the experience of the system in the years between valuations.

System	Funded Ratio	With COLA
Milton	58.9% (1/1/94)	69.9% (1/1/97)
Natick	54.3% (1/1/95)	67.2% (1/1/97)
Boston	54.0% (1/1/94)	59.4% (1/1/97)
Lowell	39.8% (1/1/95)	50.1% (1/1/97)

The progress cited created sufficient flexibility for these systems to adopt new funding schedules incorporating the COLA while avoiding substantial increases in appropriations.

System	FY98 Current Schedule	FY98 New Schedule with COLA
Milton	$2,256,392	$2,322,311 (Act.Liab.-29yrs.,Ret.Liab.-12yrs. COLA Liab.-31yrs.,All 4.5% increasing payments; includes $65,000 in administrative expenses) $2,243,643 (All Liab.-18 yrs., 4.5% increasing)
Natick	$2,967,714	$2,998,156 (Act.Liab.-27yrs.,Ret.Liab.-10yrs. COLA 27yrs Act.,10yrs. Ret., all 4.5% increasing payments)

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System	FY98 Current Schedule	FY98 New Schedule with COLA
Boston	$133,524,000	$131,496,000 (Revised 1994 Schedule-Ret.Liab.- 9yrs.,4.5% increasing payments to level dollar., Additional FY 98 Appropriation Adjusted Fy 99-01 Appropriation; includes administrative expenses of $1,500,00)
Lowell	$12,645,757	$12,201,931 (Level Dollar to 2028; Interest rate increased to 8.5%)

Milton has been presented with two options which are acceptable to PERAC and which address the liability created by acceptance of the COLA within a reasonable appropriation schedule. Similarly Natick has been presented with an option which funds the system while accommodating cost concerns. Boston has opted for a higher immediate appropriation which moderates future appropriations as well as a minor change in the 1994 Funding Schedule time frame for amortization of the Retiree Liability. Lowell in fact has a first year appropriation including COLA which is lower than its previous schedule and yet amortizes unfunded liability on a level basis. The increase in the interest rate assumption from 8.0% to 8.5% and past gains provided this flexibility.

System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Mass. Pike	n/a	$130,726,125	n/a	($649,680)
Mass. Port	n/a	$138,520,300	n/a	($47,470,699)
MHFA	n/a	$25,863,550	n/a	($1,594,331)
MWRA	n/a	$68,819,903	n/a	$8,243,212

System	Funded Ratio	Funded Ratio with COLA
Mass. Pike	101.0% (1/1/95)	100.5% (1/1/97)
Mass. Port	119.3% (1/1/95 Wyatt)	134.3% (1/1/97)
MHFA	109.4% (1/1/96)	106.2% (1/1/97)
MWRA	75.8% (1/1/94)	88.0% (1/1/97)

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System	FY98 Current Schedule	FY98 Revised Schedule with COLA	
		31 yr. 4.5%	**31 yr. Level**
Mass. Pike	$3,002,068	$2,788,065	$2,765,834
Mass. Port	$2,953,908	$0	$0
MHFA	$0	$248,207	$194,944
MWRA	$2,523,706	$2,599,142	$2,874,531

PERAC Studied Systems

In its regular schedule of actuarial valuations PERAC conducted a study as of 1/1/97 of 28 retirement systems. In addition to assessing the financial status of those systems as of that date, the Commission also conducted valuations assuming that the systems accepted the COLA. Again it was assumed that a 3% COLA would be granted in all future years on $12,000. The funding progress made by most of these systems has enabled us to present a number of funding alternatives to deal with the COLA.

An additional five systems which PERAC valued in 1996 were re-run as of 1/1/96 to assess the cost of accepting the COLA. The 1996 results were then projected to 1997 for this study.

The following outlines the impact of the COLA on the total actuarial liability of these retirement systems. Due to the fact that the liability is not offset by any assets, the effect on the unfunded liability is identical to this increase.

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System 1997 studies	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Essex Cty.	$207,835,514	$238,313,556	$83,368,317	$113,846,359
Hampshire Cty.	$137,935,663	$157,760,304	$62,799,233	$82,623,874
Middlesex Cty.	$641,105,104	$731,015,207	$232,922,036	$322,832,139
Worcester Cty.	$342,168,706	$398,741,636	$144,416,968	$200,989,898
Amesbury	$24,495,314	$28,348,045	$ 7,170,686	$ 11,023,417
Belmont	$60,886,489	$68,207,904	$22,487,725	$ 29,809,140
Chelsea	$67,397,852	$76,320,733	$35,889,084	$ 44,811,965
Chicopee	$122,707,117	$139,670,583	$50,924,865	$ 67,888,331
Clinton	$13,248,887	$15,043,449	$ 3,802,981	$ 5,597,543
Dedham	$47,072,984	$53,140,469	$14,892,787	$ 20,960,272
Easthampton	$17,675,990	$20,028,103	$ 5,057,952	$ 7,410,065
Everett	$86,447,950	$98,457,717	$40,846,538	$ 52,856,305
Fairhaven	$18,052,871	$20,763,712	$ 5,572,487	$ 8,283,328
Fitchburg	$71,872,370	$81,581,220	$26,815,573	$ 36,524,423
Framingham	$139,477,577	$156,305,408	$51,027,915	$ 67,855,746
GLSD	$3,709,377	$4,095,063	$ (1,372,428)	$ (986,742)
Lynn	$200,056,186	$226,708,563	$90,270,188	$116,922,565
Needham	$74,144,691	$85,725,669	$17,715,741	$ 29,296,719
North Attleboro	$30,367,209	$34,497,291	$5,961,110	$10,091,192
Norwood	$58,281,879	$66,119,726	$ (5,811,842)	$ 2,026,005
Peabody	$108,379,374	$125,104,294	$45,773,426	$62,498,346
Pittsfield	$93,853,928	$107,821,622	$38,448,880	$ 52,416,574
Shrewsbury	$36,241,719	$40,916,436	$ 9,816,983	$ 14,491,700
Southbridge	$20,233,314	$23,603,957	$9,592,183	$12,962,826
Waltham	$147,803,731	$164,855,756	$59,507,046	$76,559,071
Wellesley	$70,791,718	$80,164,823	$(16,614,917)	$ (7,241,812)
Westfield	$78,462,611	$88,531,933	$16,236,695	$ 26,306,017
Weymouth	$91,000,860	$102,435,943	$32,274,674	$ 43,709,757

System 1996 studies	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Bristol Cty.	$231,275,971	$268,280,126	$87,493,458	$124,497,613
Athol	$13,675,202	$16,683,746	$5,701,058	$8,709,602
Cambridge	$385,790,169	$434,129,677	$111,029,006	$159,368,514
Malden	$106,843,448	$122,869,965	$49,652,489	$65,679,006
Methuen	$61,878,115	$71,159,832	$19,258,128	$28,539,845

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The impact of the COLA on the system's Funded Ratio (percentage of assets to liabilities) provides another perspective. It should be noted that the progress that systems have made over the past decade have resulted in ratios in excess of previous estimates. In fact Funded Ratio provides a more comprehensive short hand measure of COLA impact because it incorporates all the experience of the system in the years between valuations. The chart below indicates the funded ratio as of the previous actuarial valuation and the funded ratio as of 1/1/97 including the COLA. The date of the previous valuation and the firm which conducted the valuation are also listed. If no firm is listed, PERAC performed the valuation. All 1/1/97 With COLA valuations were performed by PERAC.

System **1997 Studies**	**Funded Ratio**	**With Cola**
Essex Cty	53.0% (1/1/96 - Segal)	52.2% (1/1/97)
Hampshire Cty.	52.6% (1/1/96)	47.6% (1/1/97)
Middlesex Cty.	60.2% (1/1/96 - Coopers)	55.8% (1/1/97)
Worcester Cty.	55.6% (1/1/95 - Buck)	49.6% (1/1/97)
Amesbury	67.3% (1/1/94)	61.1% (1/1/97)
Belmont	58.2% (1/1/94)	56.3% (1/1/97)
Chelsea	39.1% (1/1/95 KPMG)	41.3% (1/1/97)
Chicopee	49.4% (1/1/95 Mercer)	51.4% (1/1/97)
Clinton	59.2% (1/1/94)	62.8% (1/1/97)
Dedham	50.8% (1/1/94)	60.6% (1/1/97)
Easthampton	65.5% (1/1/94)	63.0% (1/1/97)
Everett	46.2% (1/1/94)	46.3% (1/1/97)
Fairhaven	57.5% (1/1/94)	60.1% (1/1/97)
Fitchburg	53.9% (1/1/94)	55.2% (1/1/97)
Framingham	53.6% (1/1/95)	56.6% (1/1/97)
GLSD	121.8% (1/1/94)	124.1% (1/1/97)
Lynn	50.0% (1/1/94)	48.4% (1/1/97)
Needham	53.7% (1/1/91 Foster Higgins)	65.8% (1/1/97)
North Attleboro	65.7% (1/1/94)	70.7% (1/1/97)
Norwood	94.9% (1/1/94)	96.9% (1/1/97)
Peabody	51.3% (1/1/95 - Buck)	50.0% 1/1/97)
Pittsfield	53.5% (1/1/94)	51.4% (1/1/97)
Shrewsbury	60.0% (1/1/94)	64.6% (1/1/97)
Southbridge	40.0% (1/1/95)	45.1% (1/1/97)
Waltham	52.2% (1/1/94)	53.6% (1/1/97)
Wellesley	100.1% (1/1/95 Coopers)	109.0% (1/1/97)
Westfield	66.0% (1/1/94)	70.3% (1/1/97)
Weymouth	50.1% (1/1/94)	57.3% (1/1/97)

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System 1996 Studies	Funded Ratio	With Cola
Bristol Cty.	56.2%	53.6%
Athol	56.1%	47.8%
Cambridge	64.6%	63.3%
Malden	54.8%	46.5%
Methuen	65.0%	59.9%

The next section outlines the impact of the COLA on the FY 98 appropriations to the retirement systems. Appropriations are based on the existing systems' schedule, a revised schedule amortizing liabilities over 31 years with amortization payments increasing 4.5%, and a revised schedule amortizing liabilities over 31 years with level amortization payments. Expenses are excluded in these appropriations. These are estimates and do not reflect all of the options available to a system. Also it should be stressed that these estimates were developed employing the same actuarial assumptions as used in previous system valuations. Valid changes in assumptions can impact the appropriations required pursuant to a revised schedule.

It is the intention of PERAC to require as aggressive a schedule as possible. Thus PERAC will be reluctant to approve a revised schedule which results in lower appropriations than under the previous schedule although such is the result in some of these estimates. Appropriation estimates throughout the remainder of this report provide an estimate on a 31 year, 4.5% annual increase in amortization payment schedule and an estimate on a 31 year, level amortization payment schedule in cases in which the 4.5% increasing schedule results in an appropriation below existing levels. If the 4.5% schedule results in an estimated appropriation in excess of the existing appropriation, no estimate on the basis of a level schedule is included.

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System 1997 studies	FY98 Current Schedule	FY98 Revised Schedule with COLA	
		31 yr. 4.5%	31 yr. Level
Essex Cty	$11,712,081	$12,950,020	
Hampshire Cty.	$6,342,600	$8,043,624	$10,803,924
Middlesex Cty.	$26,413,000	$32,312,826	$43,359,463
Worcester Cty.	$12,890,032	$19,343,701	
Amesbury	$ 1,100,000	$ 1,182,527	$ 1,550,797
Belmont	$ 2,440,496	$ 2,676,688	
Chelsea	$ 4,529,413	$ 3,748,760	$ 5,264,206
Chicopee	$ 6,721,000	$ 6,000,168	$ 8,268,183
Clinton	$ 590,492	$ 784,053	
Dedham	$ 2,647,223	$ 2,096,648	$ 2,796,889
Easthampton	$ 876,443	$ 773,488	$ 1,027,045
Everett	$ 5,531,203	$ 4,672,650	$ 6,438,475
Fairhaven	$ 1,003,180	$ 951,208	$ 1,234,646
Fitchburg	$ 4,048,715	$ 3,526,661	$ 4,746,869
Framingham	$ 6,651,734	$ 6,123,379	$ 8,390,304
GLSD	$ 0	$ 27,011	
Lynn	$11,151,357	$ 9,561,604	$13,562,448
Needham	$ 2,548,528	$ 2,858,011	
North Attleboro	$1,393,000	$1,275,480	$1,612,607
Norwood	$ 785,878	$ 1,282,251	
Peabody	$4,778,110	$5,253,321	$7,341,267
Pittsfield	$ 4,884,528	$ 4,813,592	
Shrewsbury	$ 1,676,887	$ 1,435,974	$ 1,931,850
Southbridge	$1,016,871	$1,176,301	$1,609,363
Waltham	$6,801,000	$6,708,842	$9,266,528
Wellesley	$ 0	$ 837,006	
Westfield	$ 3,504,106	$ 3,438,989	$ 4,317,821
Weymouth	$ 4,976,637	$ 4,178,105	$ 5,673,761

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System 1996 studies	FY98 Current Schedule	FY98 Revised Schedule with COLA	
		31 yr. 4.5%	31 yr. Level
Bristol Cty.	$11,180,955	$13,136,341	$17,396,388
Athol	$626,260	$833,342	$1,124,313
Cambridge	$18,770,255	$16,771,298	$22,095,484
Malden	$5,353,659	$5,754,748	$7,948,953
Methuen	$2,096,477	$2,886,384	$3,815,616

Private Actuary Studied Systems

A number of retirement systems have completed actuarial valuations either as of 1/1/96 or 1/1/97 with the assistance of private actuarial firms. Plymouth County, Brookline, Concord, Gardner, Gloucester, Haverhill, Hingham, Medford, Watertown, and Worcester valuations are as of 1/1/96 and projected to 1/1/97; the remaining systems are as of 1/1/97.

System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Plymouth Cty.	$383,925,000	$443,800,000	$119,282,058	$179,157,058
Brockton	$215,971,953	$237,652,855	$94,055,673	$115,736,575
Brookline	$164,300,000	$184,350,000	$58,315,401	$78,365,401
Concord	$ 45,304,000	$ 51,136,000	$8,583,249	$14,415,249
Gardner	$27,270,560	$32,657,000	$8,768,853	$14,155,293
Gloucester	$53,398,000	$61,481,000	$18,351,876	$26,434,876
Haverhill	$144,826,000	$164,152,000	$55,666,586	$74,992,586
Hingham	$ 44,636,000	$ 50,576,400	$15,715,681	$21,656,081
Lawrence	$130,583,297	$146,365,385	$62,915,560	$78,697,648
Medford	$110,486,000	$126,065,000	$36,671,274	$52,250,274
Milford	$40,130,671	$45,026,079	$12,807,940	$17,703,348
Newton	n/a	n/a	$79,836,035	$119,780,098
Plymouth	$72,800,673	$80,085,796	$21,270,240	$28,555,363
Reading	$ 55,906,300	$ 62,364,100	$20,509,173	$26,966,973
Stoneham	$43,592,842	$49,567,842	$14,996,463	$20,971,463
Watertown	$71,873,000	$81,556,000	$25,068,097	$34,751,097
Woburn	$69,982,000	$79,518,000	$26,575,136	$36,111,136
Worcester	$429,666,000	$491,110,000	$192,490,349	$253,934,349

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This outlines the impact of the COLA on the total actuarial liability of these retirement systems. Due to the fact that the liability is not offset by any assets the effect on the unfunded liability is identical to this increase.

The impact of the COLA on the system's Funded Ratio (percentage of assets to liabilities) provides another perspective. It should be noted that the progress that systems have made over the past decade have resulted in ratios in excess of previous estimates. In fact Funded Ratio provides a more comprehensive short hand measure of COLA impact because it incorporates all the experience of the system in the years between valuations.

Appropriation estimates provide an estimate on a 31 year, 4.5% annual increase in amortization payment schedule and an estimate on a 31 year, level amortization payment schedule in cases in which the 4.5% increasing schedule results in an appropriation below existing levels. If the 4.5% schedule results in an estimated appropriation in excess of the existing appropriation, no estimate on the basis of a level schedule is included.

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System	Funded Ratio	With COLA
Plymouth Cty.	51.3% (PERAC-1/1/95)	59.6% (1/1/97)
Brockton	54.9% (PERAC-1/1/96)	51.3% (1/1/97)
Brookline	55.8% (PERAC-1/1/96)	57.5% (1/1/97)
Concord	94.8% (PERAC-1/1/96)	71.8% (1/1/97)
Gardner	51.9% (PERAC-1/1/95)	56.7% (1/1/97)
Gloucester	54.4% (PERAC-1/1/96)	57.0% (1/1/97)
Haverhill	57.3% (Segal-1/1/96)	54.3% (1/1/97)
Hingham	50.7% (PERAC-1/1/95)	57.2% (1/1/97)
Lawrence	51.5% (PERAC-1/1/96)	46.2% (1/1/97)
Medford	49.9% (PERAC-1/1/95)	58.6% (1/1/97)
Milford	59.6% (PERAC-1/1/95)	60.7% (1/1/97)
Newton	64.1% (Buck-1/1/95)	n/a
Plymouth	56.9% (PERAC-1/1/95)	64.3% (1/1/97)
Reading	59.5% (PERAC-1/1/96)	56.8% (1/1/97)
Stoneham	62.7% (PERAC-1/1/96)	57.7% (1/1/97)
Watertown	58.7% (PERAC-1/1/96)	57.4% (1/1/97)
Woburn	47.0% (PERAC-1/1/95)	54.6% (1/1/97)
Worcester	53.3% (PERAC-1/1/96)	48.3% (1/1/97)

System	FY98 Appropriation	FY98 Appropriation with COLA	
		31 yr. 4.5%	31 yr. Level
Plymouth Cty.	$14,048,000	$19,770,206	$25,900,584
Brockton	$12,296,640	$10,637,947	$14,598,209
Brookline	$7,527,000	$7,283,530	$9,901,563
Concord	$1,333,999	$1,536,944	
Gardner	$1,282,000	$1,389,884	
Gloucester	$2,963,420	$2,695,804	$3,600,350
Haverhill	$5,584,800	$7,044,329	
Hingham	$2,271,746	$1,957,299	$2,680,786
Lawrence	$7,542,011	$6,710,055	$9,402,923
Medford	$5,752,000	$4,743,213	$6,488,791
Milford	$1,625,700	$1,941,114	
Newton	$6,752,000	$9,009,700	
Plymouth	$3,194,451	$3,160,534	$4,137,638
Reading	$2,631,000	$2,220,598	$3,121,511
Stoneham	$2,226,000	$2,173,279	$2,873,894
Watertown	$4,673,000	$2,926,860	$4,087,825
Woburn	$3,141,300	$3,789,822	
Worcester	$23,673,100	$21,406,349	$30,095,449

Estimated Systems

A number of systems were analyzed based on the most recent actuarial valuation updated with estimates of the COLA. These systems are segregated by date of the last actuarial valuation which formed the basis of the estimates. The systems are set forth as follows: 1996 PERAC Valuations, 1995 PERAC Valuations and 1994 PERAC Valuations. As is the case with the previous groups analysis of the COLA includes (1) impact on Actuarial Liability and Unfunded Liability; (2) impact on Funded Ratio and (3) funding alternatives.

Appropriation estimates throughout the remainder of this report provide an estimate on a 31 year, 4.5% annual increase in amortization payment schedule and an estimate on a 31 year, level amortization payment schedule in cases in which the 4.5% increasing schedule results in an appropriation below existing levels. If the 4.5% schedule results in an estimated appropriation in excess of the existing appropriation, no estimate on the basis of a level schedule is included.

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1996 PERAC Valuations

System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Barnstable Cty.	$300,917,343	$344,550,358	$108,990,583	$152,623,598
Berkshire Cty.	$67,651,786	$77,799,553	$22,385,927	$32,533,694
Dukes Cty.	$29,268,427	$33,512,349	$12,231,978	$16,475,900
Danvers	$62,449,415	$70,880,086	$17,669,198	$26,099,869
Greenfield	$29,127,438	$33,350,917	$8,530,353	$12,753,832
Holyoke	$132,925,651	$150,205,985	$44,507,636	$61,787,970
Hull	$22,327,757	$ 25,230,365	$12,858,640	$15,761,248
Lexington	$58,766,098	$66,699,521	$7,240,491	$15,173,914
Marblehead	$43,487,519	$49,358,334	$7,525,057	$13,395,872
Maynard	$15,543,704	$17,564,385	$6,825,456	$8,846,137
Min.Reg.	$4,028,188	$4,551,852	$(1,013,283)	$(489,619)
Newburyport	$29,604,381	$33,600,973	$11,291,806	$15,288,398
North Adams	$26,040,247	$29,425,479	$7,885,742	$11,270,974
Northampton	$43,770,813	$49,679,872	$17,292,811	$23,201,870
Somerville	$143,133,805	$161,025,531	$53,710,008	$71,601,734
Swampscott	$30,620,766	$34,601,465	$13,841,507	$17,822,206
Wakefield	$53,492,151	$60,446,131	$17,279,343	$24,233,323
Webster	$13,853,923	$15,932,011	$5,443,476	$7,521,564
Winchester	$49,327,016	$56,479,433	$12,831,275	$19,983,692

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System	Funded Ratio (1/1/96)	With COLA(1/197)
Barnstable Cty	56.9%	55.7%
Berkshire Cty	66.3%	58.2%
Dukes Cty	51.5%	50.8%
Danvers	69.5%	63.2%
Greenfield	65.6%	61.8%
Holyoke	61.9%	58.9%
Hull	39.5%	37.5%
Lexington	80.4%	77.3%
Marblehead	73.8%	72.9%
Maynard	52.0%	49.6%
Min.Reg.	116.6%	110.8%
Newburyport	59.1%	54.5%
North Adams	65.6%	61.7%
Northampton	56.7%	53.3%
Somerville	57.6%	55.5%
Swampscott	52.0%	48.5%
Wakefield	60.0%	59.9%
Webster	56.1%	52.8%
Winchester	72.2%	64.6%

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System	FY98 Appropriation	FY98 Appropriation with COLA	
		31 yr. 4.5%	31 yr. Level
Barnstable Cty	$13,988,849	$16,984,282	
Berkshire Cty	$3,176,920	$ 3,723,003	
Dukes Cty.	$1,407,724	$ 1,800,650	
Danvers	$2,778,392	$ 2,342,017	$3,213,962
Greenfield	$1,235,879	$ 1,392,607	
Holyoke	$8,306,979	$ 6,520,617	$ 8,634,871
Hull	$978,352	$1,324,122	
Lexington	$2,433,000	$2,181,767	$2,688,697
Marblehead	$2,367,265	$1,741,654	$2,200,032
Maynard	$773,766	$864,519	
Min.Reg.	$0	$86,234	
Newburyport	$1,205,101	$1,538,310	
North Adams	$1,350,162	$1,151,647	$1,528,188
Northampton	$2,221,668	$2,510,415	
Somerville	$7,565,000	$6,748,329	$9,198,390
Swampscott	$1,660,415	$1,507,448	$2,102,852
Wakefield	$2,493,422	$2,445,217	$3,254,804
Webster	$749,943	$860,818	
Winchester	$2,030,111	$1,994,926	$2,662,542

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1995 PERAC Valuations

System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Hampden Cty.	$205,735,624	$236,595,968	$86,592,463	$117,452,807
Norfolk Cty.	$369,543,264	$419,431,605	$106,382,263	$156,270,604
Adams	$13,632,869	$15,677,799	$1,290,517	$3,335,447
Andover	$54,557,586	$61,922,860	$15,860,741	$23,226,015
Attleboro	$56,524,629	$64,155,453	$23,036,011	$30,666,835
Arlington	$99,857,384	$112,838,844	$18,357,064	$31,338,524
Beverly	$72,259,112	$81,652,796	$31,169,583	$40,563,267
Blue Hills	$3,273,918	$3,765,005	$(1,041,551)	$(550,464)
Braintree	$86,921,294	$98,221,062	$27,540,444	$38,840,212
Falmouth	$46,581,594	$52,870,110	$9,775,823	$16,064,339
Fall River	$201,678,132	$228,904,680	$60,372,743	$87,599,291
Leominster	$54,105,763	$61,139,512	$19,500,114	$26,533,863
Marlborough	$61,632,752	$69,645,010	$26,774,510	$34,786,768
Melrose	$48,894,512	$55,250,799	$17,742,408	$24,098,695
Montague	$12,035,414	$13,840,726	$4,219,069	$6,024,381
Revere	$86,842,505	$98,132,031	$43,457,073	$54,746,599
Saugus	$40,875,629	$46,189,461	$17,814,059	$23,127,891
Taunton	$112,850,659	$127,521,245	$42,615,622	$57,286,208
West Springfield	$47,617,684	$54,046,071	$19,582,873	$26,011,260
Winthrop	$24,503,746	$27,689,233	$7,880,568	$11,066,055

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System	Funded Ratio (1/1/95)	With COLA (1/1/97)
Hampden Cty	46.8%	50.4%
Norfolk Cty.	55.5%	62.7%
Adams	73.9%	78.7%
Andover	53.9%	62.5%
Arlington	60.7%	72.2%
Attleboro	47.7%	52.2%
Beverly	45.3%	50.3%
Blue Hills	111.7%	114.6%
Braintree	58.0%	60.5%
Fall River	56.1%	61.7%
Falmouth	59.6%	69.6%
Leominster	50.1%	56.6%
Marlborough	45.7%	50.1%
Melrose	51.2%	56.4%
Montague	49.0%	56.5%
Revere	37.5%	44.2%
Saugus	43.4%	49.9%
Taunton	50.2%	55.1%
West Springfield	48.1%	51.9%
Winthrop	51.2%	60.0%

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System	FY98 Appropriation	FY98 Appropriation with COLA	
		31 yr. 4.5%	31 yr. Level
Hampden Cty.	$8,891,000	$13,021,616	
Norfolk Cty.	$14,845,000	$16,919,402	
Adams	$744,097	$ 593,754	$ 705,185
Andover	$2,681,756	$ 2,552,556	$ 3,347,302
Arlington	$4,853,173	$ 3,263,345	$ 4,310,303
Attleboro	$3,354,238	$ 2,983,725	$ 4,008,243
Beverly	$3,448,196	$ 3,537,756	
Blue Hills	$0	$54,821	$36,431
Braintree	$4,025,928	$ 3,880,335	$ 5,177,909
Fall River	$11,279,015	$ 9,137,913	$12,064,431
Falmouth	$1,780,779	$ 2,040,325	
Leominster	$2,795,372	$ 2,771,143	$ 3,657,586
Marlborough	$3,369,368	$3,230,931	$4,393,088
Melrose	$2,862,678	$ 2,399,019	$ 3,204,109
Montague	$637,098	$570,686	$771,949
Revere	$5,933,825	$ 4,189,672	$ 6,018,647
Saugus	$2,601,742	$ 2,203,832	$ 2,995,220
Taunton	$6,500,100	$ 5,526,724	$ 7,486,938
West Springfield	$2,761,266	$ 2,433,757	$ 3,302,741
Winthrop	$1,674,632	$1,101,289	$1,470,984

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1994 PERAC Valuations

System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
New Bedford	$215,802,958	$244,936,357	$103,414,824	$132,548,223
Quincy	$263,708,553	$297,990,665	$93,272,991	$127,555,103
Salem	$78,178,325	$88,341,507	$26,941,966	$37,105,148

System	Funded Ratio (1/1/94)	With COLA (1/1/97)
New Bedford	44.4%	45.9%
Quincy	54.4%	57.2%
Salem	57.2%	58.0%

System	FY98 Appropriation	FY98 Appropriation with COLA	
		31 yr. 4.5%	31 yr. Level
New Bedford	$13,155,471	$12,024,705	$16,452,878
Quincy	$13,200,168	$12,233,036	$16,494,399
Salem	$4,032,549	$3,615,188	$4,884,848

Other Systems

For a variety of reasons, an actuarial valuation has not been completed for a small number of retirement systems for several years. PERAC has been working with these systems to update demographic information and we hope to complete a full valuation in the near future. Estimates were also developed for these systems. In each instance the most recent actuarial valuation was conducted by a private actuary.

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System	Actuarial Liability	Actuarial Liability with COLA	Unfunded Liability	Unfunded Liability with COLA
Franklin Cty.(90)	$35,000,000	$39,600,000	$8,552,000	$13,152,000
Northbridge(95)	$10,116,000	$11,431,000	$3,418,000	$4,733,000
Springfield(92)	$388,000,000	$439,000,000	$176,260,000	$227,260,000

System	Funded Ratio	With COLA 1/1/97
Franklin Cty	55.4% (1/1/90)	66.7%
Northbridge	52.3% (1/1/95)	58.6%
Springfield	50.3% (1/1/92)	48.2%

System	FY98 Appropriation	FY98 Appropriation with COLA	
		31 yr. 4.5%	31 yr. Level
Franklin Cty.	$1,482,000	$1,461,000	$1,897,000
Northbridge	$524,411	$430,000	$592,000
Springfield	$17,501,377	$15,127,000	$22,903,000

Conclusion

As of this writing PERAC has received notice of acceptance of Chapter 17 from 11 retirement boards. These include Newton, Quincy, Maynard, Dukes County, Worcester County, Franklin County, Hampden County, Middlesex County, Plymouth County, Natick and Lowell. The retirement boards in these jurisdictions will be provided with the PERAC statutory report pursuant to Chapter 17 and may grant COLAs to retirees commencing in Fiscal Year 1999.

The alternatives available to the retirement systems in absorbing the COLA costs consist of increased appropriation, changing schedule methodology, adjusting assumptions or a combination thereof. It should also be noted that the status of the system as of 1/1/98 may be the appropriate starting point in developing a strategy relative to the COLA. Gains achieved during 1997 when combined with previous gains, may reveal accelerated progress in funding the liabilities of the system and allow resources previously allocated to those liabilities to be redeployed covering COLA liabilities.

The assumptions which show the most promise for adjustment include the investment return assumption and the payroll growth assumption. In many retirement systems these assumptions may have been exceeded by experience in the case of an assumption such as investment return or may have been lower in experience than expected in the case of an assumption such as payroll growth and adjustments may be made well within accepted actuarial practice.

The funding schedule methodologies as outlined by the charts included in this report have a number of variations. Existing schedules could be increased in length or in the case of level amortization payment schedules payments could be made in increasing annual installments. The various elements of the schedule, active liability, retiree liability and COLA liability could be addressed by different types of schedules.

The completion of this report in a relatively short period of time would not have been possible without the assistance of the retirement board members and staff as well as various actuarial firms. PERAC expresses its thanks to these individuals and hopes that the cooperation displayed in this effort will be replicated in dealing with future issues.

PERAC is committed to working with each retirement board to enable the board to make a fully informed decision regarding the COLA. We have already explored a variety of funding alternatives with a number of retirement systems. In some cases we have been successful in assisting the board in developing a schedule which responsibly addresses the cost of the COLA without creating an excessive burden on the appropriating entity. We will continue to provide such assistance, as decision makers in each community consider this vital issue.