

OCTOBER, 2003

Analysis of Early Retirement Incentive Program (ERIP)

for the Middlesex Regional Retirement System



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INTRODUCTION

The Public Employee Retirement Administration Commission (PERAC) is pleased to release our analysis of Chapter 116 of the Acts of 2002, *An Act Providing for Local Government Workforce Reduction Through an Early Retirement Incentive Program (ERIP) for Certain Employees* for the Middlesex Regional Retirement System. Section 1 of the law directed PERAC to complete an analysis of the costs and liabilities attributable to the additional benefits payable in accordance with the Act and submit a report to the board by December 31, 2003.

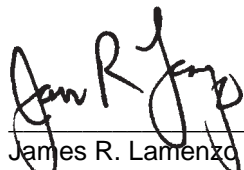
The law provides that retirement allowances of members who participated in the ERIP be determined by adding up to 5 years to the member's age and/or creditable service (any combination in full years up to a maximum of 5 years). A member's enhanced benefit cannot exceed 80% of the average rate of annual compensation used in his/her calculation. Members retiring under the program had effective dates of retirement between July 17, 2002 and December 31, 2002.

This study was based on active member data as of December 31, 2001, and additional data for retirees who were eligible for and elected the ERIP. All data was supplied by the board. We previously reviewed the December 31, 2001 data as part of the 2002 data submission process. We reviewed each member's data as both an active and retired member for reasonableness and consistency.

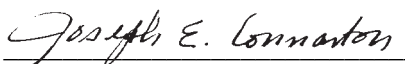
We used the investment return assumption used in the most recent actuarial valuation report. For all other assumptions, we used the standard PERAC assumption set for performing actuarial valuations as of January 1, 2002. These assumptions are the same as the assumptions used in your last actuarial valuation performed as of January 1, 2002. The assumptions are shown at the back of this report.

We believe this report represents an accurate appraisal of the costs and liabilities of the ERIP for the retirement system. This analysis was 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, related to plan experience and expectations, and represent our best estimate of anticipated experience.

Respectfully submitted,
Public Employee Retirement Administration Commission



James R. Lamenza
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Enrolled Actuary Number 02-4709*



Joseph E. Connarton
Executive Director

Dated: October 6, 2003

COST ANALYSIS BY GOVERNMENTAL UNIT

Methodology

The results of our analysis for each governmental unit that accepted the ERIP are presented on the following pages. Participating units had the option to limit the number of years and/or the number of members eligible to retire under the program. Such limitations are noted.

Our analysis of the cost of the ERIP consisted of measuring the change in both the actuarial accrued liability and normal cost before and after the application of the enhanced benefit. The amortization the increase in actuarial accrued liability and the normal cost form the basis of the impact of the ERIP on the plan's funding schedule. These items are discussed below.

Actuarial Accrued Liability

We measured the increase in actuarial accrued liability due to the incentive for each member who retired under the program. First, we valued the group as active members on January 1, 2002 (including any changes to reflect service adjustments made after January 1, 2002, such as service buy-backs). This calculation determines the liability attributable to the employees who elected the ERIP exclusive of the additional liability associated with the incentive program. These results were then brought forward on an actuarial basis to reflect the estimated accrued liability as of the average retirement date for each unit.

We then valued the same group as retirees after the application of the ERIP. These liabilities were determined as of the average retirement date for each unit.

The accrued liability for the members as retirees including the ERIP less the accrued liability for the members as active employees excluding the ERIP represents the increase in accrued liability due to the ERIP. This increase will be amortized as part of the system's funding schedule and will be a component of the system's annual appropriation. We assumed the amortization of the increase in liability would begin with the FY05 appropriation.

Normal Cost

The increase in actuarial liability is somewhat offset by a decrease in normal cost. The normal cost, or actuarial cost for the current year for active members, is shown as of January 1, 2002. There is no normal cost for retired members. Any decrease in normal cost for a retiring member would only be expected to last for a few years (the period the member would have remained in active service if the ERIP were not implemented).

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Ashby

Actives		Retirees	
Number of Members	1	Number of Members	1
Average Service	33.3	Average Age	57.2
Average Compensation	\$26,940	Average Annual Benefit	\$22,332

	As Actives	As Retirees
Total Regular Compensation	\$26,940	N/A
Total Normal Cost	\$1,800	N/A
Employee Contributions	\$1,300	N/A
Net Employer Normal Cost	\$500	N/A
Actuarial Liability (as of December 31, 2002)	\$168,200	\$259,400

Increase in Actuarial Liability (as of December 31, 2002)	\$91,200
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$11,500

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Ashland

Actives	
Number of Members	16
Average Service	23.8
Average Compensation	\$45,506

Retirees	
Number of Members	16
Average Age	59.3
Average Annual Benefit	\$31,915

	As Actives	As Retirees
Total Regular Compensation	\$728,100	N/A
Total Normal Cost	\$105,500	N/A
Employee Contributions	\$48,500	N/A
Net Employer Normal Cost	\$57,000	N/A
Actuarial Liability (as of November 30, 2002)	\$4,033,600	\$5,476,000

Increase in Actuarial Liability (as of November 30, 2002)	\$1,442,400
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$182,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Ayer

Actives		Retirees	
Number of Members	4	Number of Members	4
Average Service	24.3	Average Age	61.7
Average Compensation	\$19,116	Average Annual Benefit	\$12,700

	As Actives	As Retirees
Total Regular Compensation	\$76,500	N/A
Total Normal Cost	\$7,700	N/A
Employee Contributions	\$4,300	N/A
Net Employer Normal Cost	\$3,400	N/A
Actuarial Liability (as of December 31, 2002)	\$464,600	\$591,900

Increase in Actuarial Liability (as of December 31, 2002)	\$127,300
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$16,000

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Burlington – Limited to 23 Group 1 and 7 Group 4 Employees

Actives		Retirees	
Number of Members	30	Number of Members	30
Average Service	24.5	Average Age	60.5
Average Compensation	\$46,347	Average Annual Benefit	\$29,478

	As Actives	As Retirees
Total Regular Compensation	\$1,390,400	N/A
Total Normal Cost	\$175,000	N/A
Employee Contributions	\$82,000	N/A
Net Employer Normal Cost	\$93,000	N/A
Actuarial Liability (as of November 15, 2002)	\$7,697,500	\$9,807,500

Increase in Actuarial Liability (as of November 15, 2002)	\$2,110,000
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$268,400

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Chelmsford – Limited to 15 Group 1 and 10 Group 4 Employees

Actives		Retirees	
Number of Members	25	Number of Members	25
Average Service	24.9	Average Age	58.5
Average Compensation	\$46,145	Average Annual Benefit	\$31,938

	As Actives	As Retirees
Total Regular Compensation	\$1,153,600	N/A
Total Normal Cost	\$155,200	N/A
Employee Contributions	\$68,400	N/A
Net Employer Normal Cost	\$86,800	N/A
Actuarial Liability (as of September 15, 2002)	\$6,500,100	\$8,842,900

Increase in Actuarial Liability (as of September 15, 2002)	\$2,342,800
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$301,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Dracut – Limited to 21 Group 1 and 8 Group 4 Employees

Actives		Retirees	
Number of Members	23	Number of Members	23
Average Service	23.1	Average Age	59.0
Average Compensation	\$43,697	Average Annual Benefit	\$28,733

	As Actives	As Retirees
Total Regular Compensation	\$1,005,000	N/A
Total Normal Cost	\$136,500	N/A
Employee Contributions	\$61,000	N/A
Net Employer Normal Cost	\$75,500	N/A
Actuarial Liability (as of December 31, 2002)	\$5,193,100	\$7,341,800

Increase in Actuarial Liability (as of December 31, 2002)	\$2,148,700
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$270,700

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Groton

Actives		Retirees	
Number of Members	16	Number of Members	16
Average Service	23.7	Average Age	58.1
Average Compensation	\$48,041	Average Annual Benefit	\$30,802

	As Actives	As Retirees
Total Regular Compensation	\$768,700	N/A
Total Normal Cost	\$106,900	N/A
Employee Contributions	\$47,100	N/A
Net Employer Normal Cost	\$59,800	N/A
Actuarial Liability (as of November 15, 2002)	\$4,093,200	\$5,604,600

Increase in Actuarial Liability (as of November 15, 2002)	\$1,511,400
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$192,200

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Holliston

Actives		Retirees	
Number of Members	10	Number of Members	10
Average Service	20.9	Average Age	59.6
Average Compensation	\$35,956	Average Annual Benefit	\$18,638

	As Actives	As Retirees
Total Regular Compensation	\$359,600	N/A
Total Normal Cost	\$40,000	N/A
Employee Contributions	\$25,300	N/A
Net Employer Normal Cost	\$14,700	N/A
Actuarial Liability (as of December 31, 2002)	\$1,753,900	\$2,208,000

Increase in Actuarial Liability (as of December 31, 2002)	\$454,100
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$57,200

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Littleton

Actives		Retirees	
Number of Members	9	Number of Members	9
Average Service	24.7	Average Age	59.7
Average Compensation	\$43,858	Average Annual Benefit	\$29,887

	As Actives	As Retirees
Total Regular Compensation	\$394,700	N/A
Total Normal Cost	\$61,100	N/A
Employee Contributions	\$24,400	N/A
Net Employer Normal Cost	\$36,700	N/A
Actuarial Liability (as of October 31, 2002)	\$2,309,400	\$2,958,400

Increase in Actuarial Liability (as of October 31, 2002)	\$649,000
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$82,800

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of North Reading – Limited to 3 Group 1 Employees

Actives		Retirees	
Number of Members	3	Number of Members	3
Average Service	31.9	Average Age	60.6
Average Compensation	\$43,864	Average Annual Benefit	\$29,709

	As Actives	As Retirees
Total Regular Compensation	\$131,600	N/A
Total Normal Cost	\$10,500	N/A
Employee Contributions	\$6,000	N/A
Net Employer Normal Cost	\$4,500	N/A
Actuarial Liability (as of October 31, 2002)	\$828,400	\$1,000,300

Increase in Actuarial Liability (as of October 31, 2002)	\$171,900
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$21,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Pepperell – Limited to 4 Employees

Actives		Retirees	
Number of Members	3	Number of Members	3
Average Service	26.3	Average Age	61.4
Average Compensation	\$45,756	Average Annual Benefit	\$36,351

	As Actives	As Retirees
Total Regular Compensation	\$137,300	N/A
Total Normal Cost	\$24,300	N/A
Employee Contributions	\$6,300	N/A
Net Employer Normal Cost	\$18,000	N/A
Actuarial Liability (as of November 15, 2002)	\$862,000	\$1,159,700

Increase in Actuarial Liability (as of November 15, 2002)	\$297,700
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$37,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Shirley

Actives		Retirees	
Number of Members	5	Number of Members	5
Average Service	27.4	Average Age	58.0
Average Compensation	\$37,554	Average Annual Benefit	\$25,080

	As Actives	As Retirees
Total Regular Compensation	\$187,800	N/A
Total Normal Cost	\$16,700	N/A
Employee Contributions	\$5,900	N/A
Net Employer Normal Cost	\$10,800	N/A
Actuarial Liability (as of December 31, 2002)	\$1,066,500	\$1,330,500

Increase in Actuarial Liability (as of December 31, 2002)	\$264,000
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$33,300

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Sudbury – Limited to 1 Group 1 and 1 Group 4 Employees

Actives		Retirees	
Number of Members	2	Number of Members	2
Average Service	33.8	Average Age	55.3
Average Compensation	\$44,376	Average Annual Benefit	\$32,651

	As Actives	As Retirees
Total Regular Compensation	\$88,800	N/A
Total Normal Cost	\$9,600	N/A
Employee Contributions	\$4,300	N/A
Net Employer Normal Cost	\$5,300	N/A
Actuarial Liability (as of December 31, 2002)	\$560,600	\$771,600

Increase in Actuarial Liability (as of December 31, 2002)	\$211,000
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$26,600

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Tewksbury

Actives		Retirees	
Number of Members	33	Number of Members	33
Average Service	21.1	Average Age	62.2
Average Compensation	\$36,938	Average Annual Benefit	\$21,560

	As Actives	As Retirees
Total Regular Compensation	\$1,219,000	N/A
Total Normal Cost	\$152,900	N/A
Employee Contributions	\$71,500	N/A
Net Employer Normal Cost	\$81,400	N/A
Actuarial Liability (as of September 30, 2002)	\$5,972,100	\$7,774,300

Increase in Actuarial Liability (as of September 30, 2002)	\$1,802,200
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$231,400

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

Chapter 345 of the Acts of 2002, *An Act Relative to the Retirement of Certain Employees of the Town of Tewksbury*, allowed the Town of Tewksbury to extend the ERIP through December 31, 2003 for group 4 employees. It is our understanding that 12 employees applied under this chapter. The results above include 4 of these 12 employees. The Middlesex Regional Retirement System should furnish PERAC with the data on the remaining 8 employees when it is available, so that the additional liability for these members can be calculated.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Townsend

Actives		Retirees	
Number of Members	1	Number of Members	1
Average Service	27.4	Average Age	49.4
Average Compensation	\$55,443	Average Annual Benefit	\$38,651

	As Actives	As Retirees
Total Regular Compensation	\$55,443	N/A
Total Normal Cost	\$8,000	N/A
Employee Contributions	\$3,300	N/A
Net Employer Normal Cost	\$4,700	N/A
Actuarial Liability (as of December 31, 2002)	\$300,700	\$462,300

Increase in Actuarial Liability (as of December 31, 2002)	\$161,600
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$20,400

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Town of Westford

Actives		Retirees	
Number of Members	13	Number of Members	13
Average Service	23.3	Average Age	60.3
Average Compensation	\$35,065	Average Annual Benefit	\$21,478

	As Actives	As Retirees
Total Regular Compensation	\$455,900	N/A
Total Normal Cost	\$62,000	N/A
Employee Contributions	\$28,100	N/A
Net Employer Normal Cost	\$33,900	N/A
Actuarial Liability (as of December 15, 2002)	\$2,398,800	\$3,212,500

Increase in Actuarial Liability (as of December 15, 2002)	\$813,700
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$102,800

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Ayer Housing Authority

Actives		Retirees	
Number of Members	1	Number of Members	1
Average Service	19.1	Average Age	74.5
Average Compensation	\$37,823	Average Annual Benefit	\$20,856

	As Actives	As Retirees
Total Regular Compensation	\$37,823	N/A
Total Normal Cost	\$0	N/A
Employee Contributions	\$0	N/A
Net Employer Normal Cost	\$0	N/A
Actuarial Liability (as of December 31, 2002)	\$140,300	\$168,500

Increase in Actuarial Liability (as of December 31, 2002)	\$28,200
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$3,600

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Billerica Housing Authority – Limited to 1 Employee

Actives		Retirees	
Number of Members	1	Number of Members	1
Average Service	39.6	Average Age	62.1
Average Compensation	\$51,950	Average Annual Benefit	\$40,690

	As Actives	As Retirees
Total Regular Compensation	\$51,950	N/A
Total Normal Cost	\$3,200	N/A
Employee Contributions	\$3,200	N/A
Net Employer Normal Cost	\$0	N/A
Actuarial Liability (as of December 31, 2002)	\$356,800	\$435,600

Increase in Actuarial Liability (as of December 31, 2002)	\$78,800
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$9,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Chelmsford Water District – Limited to 4 Employees

Actives		Retirees	
Number of Members	3	Number of Members	3
Average Service	19.8	Average Age	62.8
Average Compensation	\$50,067	Average Annual Benefit	\$28,525

	As Actives	As Retirees
Total Regular Compensation	\$150,200	N/A
Total Normal Cost	\$17,000	N/A
Employee Contributions	\$10,000	N/A
Net Employer Normal Cost	\$7,000	N/A
Actuarial Liability (as of December 31, 2002)	\$764,600	\$961,800

Increase in Actuarial Liability (as of December 31, 2002)	\$197,200
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$24,800

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Dracut Water Supply

Actives		Retirees	
Number of Members	1	Number of Members	1
Average Service	13.3	Average Age	64.9
Average Compensation	\$49,480	Average Annual Benefit	\$22,972

	As Actives	As Retirees
Total Regular Compensation	\$49,480	N/A
Total Normal Cost	\$6,000	N/A
Employee Contributions	\$3,100	N/A
Net Employer Normal Cost	\$2,900	N/A
Actuarial Liability (as of December 1, 2002)	\$221,000	\$300,500

Increase in Actuarial Liability (as of December 1, 2002)	\$79,500
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$10,000

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Greater Lowell Regional School District

Actives	
Number of Members	26
Average Service	24.7
Average Compensation	\$32,871

Retirees	
Number of Members	26
Average Age	61.2
Average Annual Benefit	\$20,499

	As Actives	As Retirees
Total Regular Compensation	\$854,600	N/A
Total Normal Cost	\$69,600	N/A
Employee Contributions	\$46,400	N/A
Net Employer Normal Cost	\$23,200	N/A
Actuarial Liability (as of December 31, 2002)	\$4,640,400	\$5,967,300

Increase in Actuarial Liability (as of December 31, 2002)	\$1,326,900
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$167,100

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Groton/Dunstable Regional School District

Actives		Retirees	
Number of Members	2	Number of Members	2
Average Service	11.7	Average Age	70.9
Average Compensation	\$11,931	Average Annual Benefit	\$5,223

	As Actives	As Retirees
Total Regular Compensation	\$23,900	N/A
Total Normal Cost	\$3,800	N/A
Employee Contributions	\$1,700	N/A
Net Employer Normal Cost	\$2,100	N/A
Actuarial Liability (as of December 31, 2002)	\$73,200	\$106,000

Increase in Actuarial Liability (as of December 31, 2002)	\$32,800
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$4,100

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Littleton Housing Authority

Actives	
Number of Members	1
Average Service	17.3
Average Compensation	\$34,736

Retirees	
Number of Members	1
Average Age	62.0
Average Annual Benefit	\$17,267

	As Actives	As Retirees
Total Regular Compensation	\$34,736	N/A
Total Normal Cost	\$4,500	N/A
Employee Contributions	\$2,000	N/A
Net Employer Normal Cost	\$2,500	N/A
Actuarial Liability (as of December 1, 2002)	\$147,300	\$185,800

Increase in Actuarial Liability (as of December 1, 2002)	\$38,500
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$4,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Nashoba Valley Technical High School – Limited to 2 Employees

Actives		Retirees	
Number of Members	2	Number of Members	2
Average Service	18.3	Average Age	63.5
Average Compensation	\$16,961	Average Annual Benefit	\$8,181

	As Actives	As Retirees
Total Regular Compensation	\$33,900	N/A
Total Normal Cost	\$4,400	N/A
Employee Contributions	\$2,200	N/A
Net Employer Normal Cost	\$2,200	N/A
Actuarial Liability (as of December 31, 2002)	\$157,600	\$196,100

Increase in Actuarial Liability (as of December 31, 2002)	\$38,500
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$4,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

North Middlesex Regional School District – Limited to 4 Employees

Actives	
Number of Members	4
Average Service	24.7
Average Compensation	\$29,420

Retirees	
Number of Members	4
Average Age	58.6
Average Annual Benefit	\$17,573

	As Actives	As Retirees
Total Regular Compensation	\$117,700	N/A
Total Normal Cost	\$10,700	N/A
Employee Contributions	\$7,800	N/A
Net Employer Normal Cost	\$2,900	N/A
Actuarial Liability (as of December 31, 2002)	\$634,600	\$820,100

Increase in Actuarial Liability (as of December 31, 2002)	\$185,500
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$23,400

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Tewksbury Housing Authority – Limited to 1 Employee

Actives		Retirees	
Number of Members	1	Number of Members	1
Average Service	19.1	Average Age	66.6
Average Compensation	\$40,421	Average Annual Benefit	\$17,186

	As Actives	As Retirees
Total Regular Compensation	\$40,421	N/A
Total Normal Cost	\$5,300	N/A
Employee Contributions	\$2,300	N/A
Net Employer Normal Cost	\$3,000	N/A
Actuarial Liability (as of December 31, 2002)	\$176,200	\$204,400

Increase in Actuarial Liability (as of December 31, 2002)	\$28,200
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$3,500

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Tyngsboro Housing Authority

Actives	
Number of Members	1
Average Service	20.1
Average Compensation	\$32,146

Retirees	
Number of Members	1
Average Age	62.9
Average Annual Benefit	\$18,264

	As Actives	As Retirees
Total Regular Compensation	\$32,146	N/A
Total Normal Cost	\$3,800	N/A
Employee Contributions	\$1,900	N/A
Net Employer Normal Cost	\$1,900	N/A
Actuarial Liability (as of December 1, 2002)	\$155,900	\$190,800

Increase in Actuarial Liability (as of December 1, 2002)	\$34,900
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$4,400

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Westford Housing Authority

Actives	
Number of Members	1
Average Service	15.2
Average Compensation	\$36,757

Retirees	
Number of Members	1
Average Age	64.7
Average Annual Benefit	\$17,984

	As Actives	As Retirees
Total Regular Compensation	\$36,757	N/A
Total Normal Cost	\$5,500	N/A
Employee Contributions	\$2,400	N/A
Net Employer Normal Cost	\$3,100	N/A
Actuarial Liability (as of October 1, 2002)	\$136,500	\$189,900

Increase in Actuarial Liability (as of October 1, 2002)	\$53,400
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$6,900

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

COST ANALYSIS BY GOVERNMENTAL UNIT *(continued)*

Middlesex Regional Retirement System

Actives	
Number of Members	1
Average Service	16.8
Average Compensation	\$52,211

Retirees	
Number of Members	1
Average Age	60.6
Average Annual Benefit	\$22,995

	As Actives	As Retirees
Total Regular Compensation	\$52,211	N/A
Total Normal Cost	\$6,800	N/A
Employee Contributions	\$4,400	N/A
Net Employer Normal Cost	\$2,400	N/A
Actuarial Liability (as of July 31, 2002)	\$197,000	\$262,200

Increase in Actuarial Liability (as of July 31, 2002)	\$65,200
Amortization of Increase for FY05 (assumed average payment October 1)	
15 year level basis	\$8,500

The above results provide a measure of the increase in actuarial accrued liability and decrease in normal cost due to the ERIP. The actuarial liability and normal cost were determined as active members (before the implementation of the ERIP) and as retired members (with the enhanced ERIP benefit).

For active members, average service reflects service as of January 1, 2002 but excludes any enhanced service provided by the ERIP. For retired members, the averages are as of December 31, 2002.

EFFECT ON FUNDING SCHEDULE

Amortization of the Increase in Actuarial Accrued Liability

The bottom section of the cost page for each governmental unit shows the amortization of the increase in actuarial accrued liability on a 15-year, level amortization basis. This basis requires an annual funding amount of \$2,133,900 from FY05 through FY19. The allocation to each governmental unit is summarized below. Future system appropriations will reflect these unit costs.

Governmental Unit	Level, 15-year Effective FY05
Town of Ashby	\$11,500
Town of Ashland	\$182,900
Town of Ayer	\$16,000
Town of Burlington	\$268,400
Town of Chelmsford	\$301,900
Town of Dracut	\$270,700
Town of Groton	\$192,200
Town of Holliston	\$57,200
Town of Littleton	\$82,800
Town of North Reading	\$21,900
Town of Pepperell	\$37,900
Town of Shirley	\$33,300
Town of Sudbury	\$26,600
Town of Tewksbury	\$231,400
Town of Townsend	\$20,400
Town of Westford	\$102,800
Ayer Housing Authority	\$3,600
Billerica Housing Authority	\$9,900
Chelmsford Water District	\$24,800
Dracut Water Supply	\$10,000
Greater Lowell Regional School District	\$167,100
Groton/Dunstable Regional School District	\$4,100
Littleton Housing Authority	\$4,900
Nashoba Valley Technical High School	\$4,900
North Middlesex Regional School District	\$23,400
Tewksbury Housing Authority	\$3,500
Tyngsboro Housing Authority	\$4,400
Westford Housing Authority	\$6,900
Middlesex Regional Retirement System	\$8,500
Total	\$2,133,900

The legislation did not specify how the increased cost should be amortized under the schedule. The Board indicated that the ERIP will be funded on a 15-year level basis.

Decrease in Normal Cost

There is a decrease in employer normal cost for all units of approximately \$639,200 in FY03 for retiring members since normal cost accrues only for active members. This decrease is only expected to last a few years (the period the member would have remained in service if the ERIP were not implemented). This decrease will be partially offset by the normal cost for any members hired to replace retiring members. Any decrease in employer normal cost will be reflected in future actuarial valuations and corresponding funding schedules. We have not estimated the normal cost for new hires as part of this study.

ACTUARIAL ASSUMPTIONS

Actuarial Cost Method Entry Age Normal

Investment Return 8.25% per year

Interest Rate credited to the
Annuity Savings Fund 3.5% per year

Assumed rate of Cost of Living
Increases (COLA) 3% per year

Mortality RP- 2000 Healthy Annuitant table (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.

Service	Group 1	Group 2	Group 4
0	7.00%	7.00%	8.00%
1	6.50%	6.50%	7.50%
2	6.50%	6.50%	7.00%
3	6.00%	6.00%	6.50%
4	6.00%	6.00%	6.00%
5	5.50%	5.50%	6.00%
6	5.50%	5.50%	5.50%
7	5.00%	5.00%	5.50%
8	5.00%	5.00%	5.25%
9	4.75%	5.00%	5.25%
10+	4.75%	5.00%	5.25%

ACTUARIAL ASSUMPTIONS *(continued)*

Retirement

Age	Groups 1 & 2		Group 4
	Male	Female	
45	0.000	0.000	0.010
46	0.000	0.000	0.010
47	0.000	0.000	0.010
48	0.000	0.000	0.010
49	0.000	0.000	0.010
50	0.010	0.015	0.020
51	0.010	0.015	0.020
52	0.010	0.020	0.020
53	0.010	0.025	0.050
54	0.020	0.025	0.075
55	0.020	0.055	0.150
56	0.025	0.065	0.100
57	0.025	0.065	0.100
58	0.050	0.065	0.100
59	0.065	0.065	0.150
60	0.120	0.050	0.200
61	0.200	0.130	0.200
62	0.300	0.150	0.250
63	0.250	0.125	0.250
64	0.220	0.180	0.300
65	0.400	0.150	1.000
66	0.250	0.200	1.000
67	0.250	0.200	1.000
68	0.300	0.250	1.000
69	0.300	0.200	1.000
70	1.000	1.000	1.000

ACTUARIAL ASSUMPTIONS *(continued)*

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

Age	<u>Groups 1 & 2</u>	Group 4
20	0.00010	0.0010
30	0.00030	0.0030
40	0.00101	0.0030
50	0.00192	0.0125
60	0.00280	0.0085

Based on an analysis of past experience. It is also assumed that the percentage of job-related disabilities is 55% for Groups 1 & 2 and 90% for Group 4.

Withdrawal

Based on analysis of past experience. Annual rates are based on years of service. Sample annual rates for Groups 1 and 2 are shown below. For Group 4 members the rate is 0.015 each year for service up to and including 10 years. No withdrawal is assumed thereafter.

Groups 1 & 2

Service	Groups 1 & 2
0	0.150
5	0.076
10	0.054
15	0.033
20	0.020

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