EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF RHODE ISLAND

Actuarial Valuation as of
June 30, 1987

MARTIN E. SEGAL COMPANY
CONSULTANTS AND ACTUARIES

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March 31, 1988

Retirement Board of Employees'
Retirement System
State of Rhode Island
198 Dyer Street
Providence, RI 02903

Dear Members of the Board:

We are pleased to submit herewith our Actuarial Valuation of the Employees' Retirement System of the State of Rhode Island as of June 30, 1987.

Our report analyzes the actuarial status of the System, and projects the cost requirements for the Board to certify to the Legislature.

We received a great deal of help from State employees in obtaining the information which forms the basis of this report. Most important, Mr. Donald R. Hickey, Executive Director, Mr. John F. Sullivan, Assistant Director, and Mr. Louis Capizano, Supervisory Accountant, were available whenever needed to answer any questions and provide any information requested. Indeed, the material they provided on their own initiative anticipated many of our needs.

For convenience, this report is divided into the following sections:

ATLANTA / BOSTON / CHICAGO / CLEVELAND / DALLAS / DENVER / HARTFORD / HOUSTON / LOS ANGELES
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Appended to this report is our actuarial certificate detailing the cost factors, assumptions, and plan of benefits used for the valuation.

We will be pleased to meet with you to discuss this report at your convenience.

Sincerely,

MARTIN E. SEGAL COMPANY, INCORPORATED

By ______________________
Sherman G. Sass
Senior Vice President

By ______________________
James R. Laws, F.S.A., M.A.A.A
Vice President and Actuary

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I. SUMMARY

Benefit Provisions

The Employees' Retirement System of the State of Rhode Island covers most State employees. Legislators and elected officials may become members on an optional basis. State college teachers may elect coverage under the T.I.A.A. program. State employees contribute 7 1/2* per cent of their annual earnings and Teachers contribute 8 1/2* per cent.

The System provides unreduced benefits of 1.7 per cent of earnings for each of the first ten years of service; 1.9 per cent for each of the next ten years; 3.0 per cent per year for each of the next fourteen years; and 2 per cent for the 35th year. The maximum benefit is 80 per cent of final average earnings after 35 years of service. Such benefits are available to members at least age 60 with 10 years of service, or after 30 years at any age. State correctional officers may retire at age 50 if they have 20 years of service, at 2 per cent for each of the first 30 years of service; 6 per cent for the 31st year; 5 per cent for the 32nd year; 4 per cent for the 33rd year; 3 per cent for the 34th year; and 2 per cent for the 35th year. Benefits are based on the average of the highest three consecutive years' earnings. After the third anniversary of retirement, "cost-of-living increases" amounting to 3 per cent per year are provided, independent of actual changes in the Consumer Price Index. Beginning January 1, 1981, the cost-of-living increases are computed at the rate of 3 per cent compounded annually; prior to 1981, the cost-of-living benefits equalled 3 per cent of the original award.

The Plan also provides non-service-connected disability after five years of service; service-connected disability pensions with no minimum service requirement; vested benefits after ten years of service; widow's benefits for service-connected death; and certain lump sum death benefits.

*Prior to July 1, 1986 the rates were 7 per cent for State employees and 8 per cent for Teachers.

More detail regarding the benefit provisions can be found in the actuarial certificate following this report.

Employee Data

We received data on 14,375 active State Employees and 10,307 Teachers as of June 30, 1987 who were participating in the System. On the average, the State Employees were age 43 1/2 and had 10 years of service; Teachers were age 44 with 16 years of service.

Retiree Data

We received data on 6,567 State Employee pensioners and 495 beneficiaries as of June 30, 1987. The pensioners' average monthly benefit was $596, which is approximately 10% greater than the average benefit on June 30, 1986. There were 3,276 retired Teachers and 138 beneficiaries; the average monthly benefit was $1,147 for the pensioners, which is approximately 11% greater than the average benefit a year earlier. The benefit amounts include an adjustment for the cost-of-living provision. Of all the pensioners on the rolls, 11 per cent had retired in the year ended June 30, 1987.

Retirement Fund

As of June 30, 1987, the assets of the Retirement Fund at book value, including Teachers Survivors Reserves, amounted to approximately $1.208 billion. Effective June 30, 1985, the Board adopted an asset valuation method which recognizes the market value of assets but smoothes the fluctuations in the market value of assets. The asset value on this basis is referred to as the actuarial value of assets. On this basis, the assets amounted to $1.309 billion as of June 30, 1987. These assets are available as an offset to the actuarial liabilities for future benefits. At market value, assets totalled $1.551 billion on June 30, 1987.

Actuarial Valuation

The actuarial valuation was prepared as of June 30, 1987. Our calculations were based on reasonable assumptions as to expected future experience. For this valuation we have not revised any of the actuarial assumptions or methods. With our June 30, 1985 valuation, we incorporated the legislated change in the cost method to the entry age normal cost with the frozen initial liability method which became effective July 1, 1985. Funding of the frozen initial liability is based on the sum of the digits amortization basis plus interest on the outstanding liability. All of the assumptions and methods are detailed in the attached Certificate of Actuarial Valuation.

The employer normal cost* for State Employees is $12.0 million. This represents 3.9 per cent of the reported payroll of participating State Employees as of June 30, 1987. The employer normal cost for Teachers is $15.9 million or 4.6 per cent of reported participating payroll.

For State Employees, the unfunded actuarial accrued liability* as of June 30, 1987 is $433 million. For Teachers, the unfunded actuarial accrued liability as of June 30, 1987 is $748 million. The unfunded actuarial accrued liabilities as of June 30, 1985 have been "frozen" and are being amortized over 30 years.

The combined value of the System's vested benefits is $1.89 billion. The assets at actuarial value (excluding assets of the Teachers Survivors program) are short of this amount by $629 million.

For the 1988-89 fiscal year, the State's statutory funding schedule, as amended effective July 1, 1979, calls for a contribution of 100 per cent of the employer normal cost, 100 per cent of the interest on the unfunded actuarial accrued liability and the third amortization payment on the frozen unfunded liability. For State Employees, these total to $48.4 million, or 13.6 per cent of the projected 1988-89 payroll of $356.1 million and, for Teachers, the total employer costs are $77.3 million, or 20.3 per cent of projected payroll of $380.6 million. (Half of the cost

*Please refer to Section V, "Actuarial Assumptions and Cost Method", for definitions of these terms.

for Teachers is paid for by the municipalities.) In accordance with the statute as amended, the percentages of normal cost and interest on the unfunded liability required to be contributed have gradually increased to the 100 per cent level starting in fiscal 1985-86. Beginning in fiscal 1986-87, amortization of the frozen unfunded liabilities was also required and has been recognized in the recommendations made in this valuation and the preceding two valuations.

II. EMPLOYEE DATA

We received data on 14,375 State Employees and 10,307 Teachers participating in the System on June 30, 1987. The data included age, service, sex, and salary for each participant. The average salary as of June 30, 1987 of the participants was $21,600 for State Employees and $33,400 for Teachers. The data included 338 Correctional Officers and 147 Legislators.

Tables 1A and 1B give detailed age, service and average salary data on State Employees and Teachers, respectively. In preparing these tables, we assumed an annual salary of $20,000 for the State Employees for whom earnings were missing, and a $25,000 annual salary for Teachers with unknown earnings.

Tables 2A and 2B summarize certain basic statistics on active State Employees and Teachers and compare them to those of the previous year. During the year, the average salary for State Employees increased by 8.5 per cent while Teachers' average salary increased by 7.1 per cent. Aggregate payroll increased by 5.5 per cent for State Employees and by 11.7 per cent for Teachers.

Table 1A

Number and Average Salaries of Employees in Active Service as of June 30, 1987 by Age and by Years of Service

STATE EMPLOYEES

		Years of service								
Age	Total	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 and over	Unknown
Total	14,375 $21,600	4,187 $19,000	3,479 $20,400	3,290 $22,300	1,944 $23,800	807 $26,600	418 $28,700	126 $30,600	55 $29,100	69 $13,400
Under 20	18 $13,100	18 $13,100	--	--	--	--	--	--	--	--
20 - 24	536 16,500	508 16,500	28 $16,700	--	--	--	--	--	--	--
25 - 29	1,472 18,500	922 18,600	470 18,400	80 $18,600	--	--	--	--	--	--
30 - 34	1,995 20,500	670 20,500	641 20,600	615 20,700	66 $20,500	--	--	--	--	3 $ 5,900
35 - 39	2,188 22,600	562 19,900	543 22,500	679 24,100	367 24,400	32 $22,000	--	--	--	5 11,100
40 - 44	1,952 23,400	486 19,500	460 22,000	469 24,900	387 27,200	133 25,500	14 $25,900	--	--	3 6,700
45 - 49	1,574 22,600	377 19,600	342 20,900	352 22,000	246 25,000	160 28,900	82 27,800	10 $27,400	--	5 4,200
50 - 54	1,518 22,600	278 19,200	333 20,000	333 21,900	265 22,900	149 28,200	117 30,100	36 30,800	4 $26,600	3 13,000
55 - 59	1,716 21,500	270 18,200	336 19,000	421 21,000	351 21,300	174 26,200	113 29,000	31 30,000	14 26,100	6 28,700
60 - 64	1,069 22,100	83 18,900	245 20,100	266 20,800	212 21,900	129 24,600	71 26,100	36 31,700	25 30,300	2 10,200
65 and over	274 23,200	8 16,200	60 19,000	74 20,600	50 22,900	30 28,300	21 34,000	13 30,600	12 30,800	6 13,400
Unknown	63 9,300	5 16,600	21 300	1 300	--	--	--	--	--	36 13,800

Table 1B

Number and Average Salaries of Employees in Active Service as of June 30, 1987 by Age and by Years of Service

TEACHERS

Age	Total	Years of service								
		0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30- 34	35 and over	Unknown
Total	10,307 $33,400	1,019 $25,300	1,196 $32,100	2,105 $33,900	3,249 $34,600	1,301 $35,700	723 $36,700	293 $37,600	95 $37,400	326 $28,500
Under 20	5 $35,200	--	--	--	--	--	--	--	--	5 $35,200
20 - 24	49 19,900	41 $18,200	--	--	--	--	--	--	--	8 29,000
25 - 29	302 23,200	213 21,900	62 $27,400	1 $32,800	--	--	--	--	--	26 24,100
30 - 34	888 30,400	194 25,200	434 31,200	230 33,400	1 $33,600	--	--	--	--	29 29,000
35 - 39	2,690 33,100	232 26,600	273 32,600	1,149 33,600	992 34,100	4 $35,100	--	--	--	40 31,700
40 - 44	2,463 34,100	175 26,200	188 33,200	325 34,400	1,373 34,800	360 35,500	4 $34,900	--	--	38 33,400
45 - 49	1,387 35,100	81 28,700	115 33,600	173 34,400	353 35,000	478 36,100	171 37,700	--	--	16 31,200
50 - 54	1,011 35,700	34 30,200	52 33,500	104 34,900	214 34,700	202 36,100	298 37,000	96 $37,100	3 $37,800	8 32,100
55 - 59	796 35,500	15 35,100	30 34,900	66 33,900	214 34,300	134 35,300	146 35,700	145 38,000	39 37,000	7 33,000
60 - 64	391 35,300	5 28,000	19 32,700	39 35,300	77 34,800	94 34,300	77 35,700	37 37,400	40 37,700	3 32,700
65 and over	148 33,700	9 28,300	8 31,300	6 34,200	21 35,000	27 34,900	27 35,100	14 37,100	12 38,200	24 28,300
Unknown	177 26,800	20 23,800	15 31,100	12 34,300	4 33,500	2 36,800	--	1 32,000	1 35,400	122 25,500

Table 2A

Statistical Data on Active State Employees on June 30, 1987 and 1986

	June 30, 1987	June 30, 1986
Number of covered employees	14,375	14,735
Total annual salary	$309,943,000	$293,816,800
Average annual salary	$21,600	$19,900
Average age	43 1/2	44
Average years of service	10	10 1/2
Number eligible for service retirement	1,034	1,406
Number vested but not eligible to retire	5,606	5,453

Table 2B

Statistical Data on Active Teachers
on June 30, 1987 and 1986

	June 30, 1987	June 30, 1986
Number of covered employees	10,307	9,886
Total annual salary	$344,596,000	$308,439,200
Average annual salary	$33,400	$31,200
Average age	44	43
Average years of service	16	16
Number eligible for service retirement	756	665
Number vested but not eligible to retire	7,010	6,795

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III. RETIREE DATA

The data on retired members and beneficiaries included age, sex, monthly benefit, retirement date, option, and type of pension.

The following are significant statistics on the retired group:

	State Employees	Teachers
Pensioners:		
Number	6,567	3,276
Average age	70	72 1/2
Average monthly benefit	$596	$1,147
Beneficiaries:		
Number	495	138
Average age	72	71
Average monthly benefit	$489	$714

During the 1986-87 fiscal year, there were 936 new State Employee retirees. This may be compared to the 453 new State retirees during the preceding fiscal year. This significant increase is attributable to the early retirement incentive program which was in effect during part of the 1986-87 fiscal year.

Table 3A shows a distribution of the 936 State Employee pensions which became effective during the 1986-87 fiscal year by type and amount of pension. Table 4A shows a distribution of these same new awards by type of pension and age at retirement. Tables 3B and 4B are the corresponding distributions for the 263 Teacher pensions which became effective during the 1986-87 fiscal year.

Tables 5A and 5B show distributions for all pensions in force as of June 30, 1987 by type and amount of pension. Tables 6A and 6B show distributions of these same retirees by type of pension and age as of June 30, 1987.

Overall, the data on retirees was quite good. A minor problem, which has no impact on cost, is that some beneficiaries may not be classified as such and therefore they would be treated as pensioners.

The data on terminated employees with vested rights to a deferred benefit did not include enough information to calculate the total cost for them. We therefore continued the past practice of including an actuarial liability equal to their accumulated employee contributions. We again recommend that information regarding terminated vested employees be obtained and maintained by the System so that it can be incorporated in future valuations and better reflected in the actuarial cost calculations.

Table 3A

Pensions Awarded in the Year Ended June 30, 1987
by Type and by Monthly Amount

STATE EMPLOYEES

Monthly amount	Total	Type of pension				
		Service	Ordinary Disability	Accidental Disability	Legislator	Beneficiary
Total	936	868	37	4	8	19
$ 50 - 99	15	13	2	--	--	--
100 - 149	27	24	3	--	--	--
150 - 199	40	31	7	1	--	1
200 - 249	68	56	4	1	4	3
250 - 299	77	69	4	1	1	2
300 - 349	64	60	1	--	--	3
350 - 399	60	59	--	--	--	1
400 - 449	45	39	3	--	--	3
450 - 499	43	39	3	--	1	--
500 - 599	76	70	4	--	2	--
600 - 699	46	44	1	--	--	1
700 - 799	46	39	3	--	--	4
800 - 899	42	40	1	--	--	1
900 - 999	26	26	--	--	--	--
1,000 - 1,099	25	25	--	--	--	--
1,100 - 1,199	26	26	--	--	--	--
1,200 - 1,299	21	21	--	--	--	--
1,300 - 1,399	26	25	--	1	--	--
1,400 - 1,499	21	21	--	--	--	--
1,500 - 1,999	88	87	1	--	--	--
2,000 - 2,499	36	36	--	--	--	--
2,500 - 2,999	12	12	--	--	--	--
3,000 - 3,499	3	3	--	--	--	--
3,500 - 3,999	2	2	--	--	--	--
4,500 - 4,999	1	1	--	--	--	--

Table 3B

Pensions Awarded in the Year Ended June 30, 1987
by Type and by Monthly Amount

TEACHERS

Monthly amount	Total	Type of pension			
		Service	Ordinary Disability	Accidental Disability	Beneficiary
Total	263	249	6	1	7
$ 250 - 299	1	--	--	--	1
300 - 349	2	--	--	--	2
350 - 399	1	1	--	--	--
400 - 449	1	1	--	--	--
450 - 499	2	2	--	--	--
500 - 599	5	3	1	--	1
600 - 699	8	6	2	--	--
700 - 799	14	14	--	--	--
800 - 899	13	11	1	--	1
900 - 999	10	9	--	--	1
1,000 - 1,099	11	10	1	--	--
1,100 - 1,199	9	8	1	--	--
1,200 - 1,299	13	13	--	--	--
1,300 - 1,399	14	13	--	1	--
1,400 - 1,499	11	11	--	--	--
1,500 - 1,999	83	82	--	--	1
2,000 - 2,499	42	42	--	--	--
2,500 - 2,999	16	16	--	--	--
3,000 - 3,499	4	4	--	--	--
3,500 - 3,999	3	3	--	--	--

Table 4A

Pensions Awarded in the Year Ended June 30, 1987
by Type and by Age on Effective Date

STATE EMPLOYEES

Age on effective date		Total	Type of pension				
			Service	Ordinary Disability	Accidental Disability	Legislator	Beneficiary
Total		936	868	37	4	8	19
35 - 39		3	--	2	--	--	1
40 - 44		4	--	1	1	1	1
45 - 49		8	5	2	--	--	1
50		6	5	1	--	--	--
51		6	3	2	1	--	--
52	43	7	7	--	--	--	--
53		12	10	2	--	--	--
54		12	8	4	--	--	--
55		21	14	3	--	3	1
56		24	20	1	--	1	2
57	103	26	20	5	--	--	1
58		14	10	3	1	--	--
59		18	11	6	1	--	--
60		123	119	1	--	--	3
61		105	100	1	--	1	3
62	536	134	132	--	--	--	2
63		73	72	1	--	--	--
64		101	98	2	--	--	1
65		93	93	--	--	--	--
66		49	49	--	--	--	--
67	222	26	24	--	--	1	1
68		24	23	--	--	--	1
69		30	29	--	--	--	1
70 and over		17	16	--	--	1	--

Table 4B

Pensions Awarded in the Year Ended June 30, 1987
by Type and by Age on Effective Date

TEACHERS

Age on effective date	Total		Type of pension			
			Service	Ordinary Disability	Accidental Disability	Beneficiary
Total		263	249	6	1	7
25 - 29		1	--	--	--	1
35 - 39		1	--	1	--	--
45 - 49		3	--	--	1	2
50	17	2	--	2	--	--
52		2	2	--	--	--
53		2	1	--	--	1
54		11	11	--	--	--
55	80	12	11	--	--	1
56		13	12	--	--	1
57		18	17	1	--	--
58		22	22	--	--	--
59		15	13	2	--	--
60	113	43	43	--	--	--
61		27	27	--	--	--
62		19	19	--	--	--
63		8	7	--	--	1
64		16	16	--	--	--
65	43	17	17	--	--	--
66		13	13	--	--	--
67		6	6	--	--	--
68		4	4	--	--	--
69		3	3	--	--	--
70 - 74		5	5	--	--	--

Table 5A

Pensions in Payment Status on June 30, 1987
by Type and by Monthly Amount

STATE EMPLOYEES

Monthly amount	Total	Type of pension				
		Service	Ordinary Disability	Accidental Disability	Legislator	Beneficiary
Total	7,062	5,842	474	104	147	495
Under $50	16	11	--	4	--	1
$ 50 - 99	191	145	16	11	--	19
100 - 149	354	291	25	9	--	29
150 - 199	690	560	71	7	--	52
200 - 249	727	562	95	5	19	46
250 - 299	587	455	73	7	13	39
300 - 349	511	409	34	4	26	38
350 - 399	479	373	37	4	23	42
400 - 449	322	263	25	1	7	26
450 - 499	334	272	21	4	12	25
500 - 599	525	428	22	8	27	40
600 - 699	378	291	15	12	20	40
700 - 799	324	275	15	10	--	24
800 - 899	268	233	12	3	--	20
900 - 999	219	193	6	7	--	13
1,000 - 1,099	182	168	4	4	--	6
1,100 - 1,199	131	121	1	--	--	9
1,200 - 1,299	91	88	--	--	--	3
1,300 - 1,399	108	103	--	1	--	4
1,400 - 1,499	96	90	--	2	--	4
1,500 - 1,999	340	326	2	1	--	11
2,000 - 2,499	116	114	--	--	--	2
2,500 - 2,999	45	44	--	--	--	1
3,000 - 3,499	19	19	--	--	--	---
3,500 - 3,999	8	7	--	--	--	1
4,500 - 4,999	1	1	--	--	--	--

Table 5B

Pensions in Payment Status On June 30, 1987
by Type and by Monthly Amount

TEACHERS

Monthly amount	Total	Type of pension			
		Service	Ordinary Disability	Accidental Disability	Beneficiary
Total	3,414	3,144	115	17	138
$ 50 - 99	4	3	--	1	--
100 - 149	13	12	--	--	1
150 - 199	14	11	--	--	3
200 - 249	33	26	2	--	5
250 - 299	38	33	1	--	4
300 - 349	59	52	3	--	4
350 - 399	58	47	5	1	5
400 - 449	55	38	6	--	11
450 - 499	92	72	11	--	9
500 - 599	177	150	9	--	18
600 - 699	186	148	17	--	21
700 - 799	221	191	15	1	14
800 - 899	220	196	16	--	8
900 - 999	270	250	11	--	9
1,000 - 1,099	284	270	7	--	7
1,100 - 1,199	270	259	5	1	5
1,200 - 1,299	262	252	5	2	3
1,300 - 1,399	228	217	--	8	3
1,400 - 1,499	211	206	2	1	2
1,500 - 1,999	535	528	--	1	6
2,000 - 2,499	136	135	--	1	--
2,500 - 2,999	38	38	--	--	--
3,000 - 3,499	6	6	--	--	--
3,500 - 3,999	4	4	--	--	--

Table 6A

Pensions in Payment Status on June 30, 1987
by Type and by Age

STATE EMPLOYEES

Age on June 30, 1987	Total	Type of pension				
		Service	Ordinary Disability	Accidental Disability	Legislator	Beneficiary
Total	7,062	5,842	474	104	147	495
30 - 34	8	--	4	--	--	4
35 - 39	14	--	9	3	--	2
40 - 44	26	--	13	6	1	6
45 - 49	27	5	13	4	1	4
50 - 54	101	39	39	11	2	10
55 - 59	306	156	75	19	29	27
60 - 64	1,270	1,037	115	19	29	70
65 - 69	1,803	1,589	98	17	24	75
70 - 74	1,628	1,422	66	11	32	97
75 - 79	1,034	878	37	11	12	96
80 - 84	544	477	4	2	8	53
85 - 89	219	175	1	1	5	37
90 - 94	70	56	--	--	3	11
95 - 99	10	7	--	--	1	2
100 - 104	2	1	--	--	--	1

Table 6B

Pensions in Payment Status on June 30, 1987 by Type and by Age

TEACHERS

Age on June 30, 1987	Total	Type of pension: Service	Ordinary Disability	Accidental Disability	Beneficiary
Total	3,414	3,144	115	17	138
35 - 39	5	--	5	--	--
40 - 44	4	--	2	--	2
45 - 49	14	--	7	3	4
50 - 54	38	11	14	2	11
55 - 59	180	147	20	3	10
60 - 64	482	439	25	3	15
65 - 69	690	649	21	4	16
70 - 74	602	574	9	2	17
75 - 79	661	634	7	--	20
80 - 84	480	447	2	--	31
85 - 89	177	165	2	--	10
90 - 94	65	63	1	--	1
95 - 99	16	15	--	--	1

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IV. RETIREMENT FUND

The State maintains the Employees' Retirement Fund. The Retirement Board provided us with financial statements as of June 30, 1987.

The Fund receives all member and employer contributions. The assets are invested by the State Investment Commission, with the income being added to the Fund and available for reinvestment.

Payments from the Fund are primarily for refunds of employee contributions, lump sum death benefits, and pension payments. Contribution refunds occur when an employee terminates employment and elects to take a refund, or when he dies after retirement without having received payments from the Fund equal to his total contributions.

Table 7 provides a summary of income and expenditures for the years ended June 30, 1987 and 1986.

On June 30, 1987, assets as reported by the State totalled approximately $1.208 billion. Table 8 shows the composition of the assets and compares them to those of the previous year. About 68 per cent of the Fund was invested in fixed income securities such as bonds and notes. This represents no change from a year earlier.

The financial statements indicate that 47 per cent of the assets relate to State Employees, 49 1/2 per cent are for Teachers, and 3 1/2 per cent relate to Teachers Survivors benefits. There is also a small unallocated reserve for unclaimed benefits. Table 9 shows the allocation of assets in detail as of June 30, 1987 and 1986.

Assets prior to June 30, 1985 were carried at values as reported by the State. Bonds were carried at amortized cost value and stocks were carried at cost value. Beginning with the June 30, 1985 actuarial valuation, the Board adopted an asset valuation method for actuarial cost purposes which takes fair market value into account without subjecting the system to abnormal cost fluctuations from year to year as a result of short term changes in market value.

On the "actuarial value" basis, the assets on June 30, 1987 amounted to $1,308,812,548. The development of this amount is shown in the following chart:

Determination of Actuarial Value of Assets

1.	Actuarial value of assets at beginning of year	$1,107,357,824
2.	Net new money (including dividends and interest)	140,977,110
3.	Preliminary value of assets at end of year: (1) + (2)	1,248,334,934
4.	Market value of assets at end of year	1,550,723,002
5.	Minimum actuarial value: 80% of (4)	1,240,578,402
6.	Maximum actuarial value: 120% of (4)	1,860,867,602
7.	Trial write-up: 20% of [(4) - (3)]	60,477,614
8.	Trial actuarial value: (3) + (7)	1,308,812,548
9.	Final actuarial value of assets at end of year: (8), but not less than (5) or more than (6)	1,308,812,548
10.	Final write-up: (9) - (3)	60,477,614

This determination is used for two purposes:

First, the actuarial value is applied in determining the value of assets used in the actuarial calculations to determine the annual costs.

Second, the amount of write-up or write-down is considered part of the investment yield for the year.

This procedure treats realized and unrealized capital gains equally. In other words, the sale of a security - either at a gain or loss - will have no effect on the actuarial value. This should remove from the area of investment decisions any consideration of the impact of security sales on the actuarial cost of the plan.

Table 7

Summary Statement of Income and Expenses
For the Years Ended June 30, 1987 and 1986

	1987		1986	
Employer contributions	$ 98,939,864		$103,521,261	
Member contributions	52,132,541		46,364,171	
Total contributions		$151,072,405		$149,885,432
Net miscellaneous items		555,617		422,501
Investment income:				
Dividends	$19,295,496		$16,847,105	
Interest	68,766,648		65,620,860	
Capital gains and (losses)	20,877,873		19,299,989	
Expenses	964,595		741,277	
Net investment income		107,975,422		101,026,678
Total income available for benefit payments		$259,603,444		$251,334,611
Benefits payments:				
Pension benefits	$91,249,113		$73,808,887	
Death benefits	2,316,014		1,233,814	
Contribution refunds	4,183,334		3,923,728	
Total benefit payments		97,748,461		78,966,429
Excess of income over expenses		$161,854,984		$172,368,182

Note: Detail figures may not add to totals shown because of rounding.

RHODE ISLAND ERS

Table 8

Assets as of June 30, 1987 and 1986

	1987		1986	
Cash (overdraft)		$ 3,040,328		$ 10,770,496
Accrued interest receivable		15,623,500		14,253,088
Investments				
Government bonds	$429,632,972		$417,489,682	
Corporate bonds	117,256,200		92,127,200	
Common and preferred stocks and united partnership	370,600,960		312,802,442	
Short-term paper	275,391,771		--	
Certificates of deposit and repurchase agreements	--		97,100,000	
Commercial paper	--		106,790,322	
International bond	500,000		500,000	
(Less) Unamortized premiums and discounts	(3,589,745)	1,189,792,157	(5,232,229)	$1,021,577,417
Total assets		$1,208,455,985		$1,046,601,001

Note: Detail figures may not add to totals shown because of rounding.

RHODE ISLAND ERS

Table 9

Allocation of Assets by Plan
as of June 30, 1987 and 1986

	1987		1986	
State Employees:				
Employer reserves	$439,101,876		$384,925,686	
Member reserves	129,837,182		120,889,860	
Total State Employees reserves		$ 568,939,058		$ 505,815,546
Teachers:				
Employer reserves	$403,384,702		$328,021,756	
Member reserves	195,571,575		175,746,196	
Total Teacher reserves		598,956,277		503,767,953
Teachers Survivors:				
Employer reserves	$ 32,035,139		$ 28,915,657	
Member reserves	8,312,806		7,893,766	
Total Teachers Survivors reserves		40,347,945		36,809,423
Unallocated:				
Unclaimed benefit reserve		212,704		208,080
Total assets		$1,208,455,985		$1,046,601,001

Note: Detail figures may not add to totals shown because of rounding.

RHODE ISLAND ERS

V. ACTUARIAL ASSUMPTIONS AND COST METHOD

The actual cost of a pension plan consists of the benefit payments and administrative expenses less any investment earnings. An actuarial cost method aims to budget this cost so as to establish a reasonable relationship between employer pension contributions and the employee service that gives rise to the pension obligation. The result is a series of employer contributions over a long period of years. A fund accumulates which earns investment income, thus reducing the ultimate cost. Beginning with the June 30, 1985 actuarial valuation, the actuarial cost method was changed as stipulated in Section 36-10-2 of the General Laws of Rhode Island. This method is reviewed at the end of this Section.

Calculating the appropriate contribution requires that projections, and therefore assumptions, be made as to future experience. Some items, such as mortality rates, can be predicted fairly accurately. Others, such as future salary increases are, of course, subject to considerable variation. It will be useful to identify the assumptions used, particularly since broad questions of fiscal policy are implicit in certain of the assumptions. The assumptions applied in this valuation are the same as those used in the June 30, 1986 study.

Mortality Rates

We continue to apply mortality rates taken from the Male and Female 1971 Group Annuity Mortality Tables. These are the most commonly used tables of pension plan mortality, and we believe they continue to be reasonable for estimating experience under the System. Table 10 gives some life expectancies determined from these tables.

Salary Projections

The System provides benefits that are based on the three highest consecutive years' salary for each employee. To assume that each employee's salary will be the same in the three years before retirement as it is today would seriously understate the System's cost. Accordingly, we use a salary projection to anticipate future increases in earnings.

Additionally, it is appropriate to compute pension costs which are level as a percentage of payroll rather than level as a dollar amount, and a salary projection is also used for this purpose. If the cost were calculated as a level dollar amount for an individual, the cost might be a high per cent of his pay when he is young and a lower per cent of his higher salary at a later age. Establishing pension costs which remain a level percentage of salary means that pension costs will be incurred at the same rate as salary is paid to an employee.

The projection of future salaries must anticipate, among other items, future general salary increases. Over the long term, it can be expected that these will parallel or slightly exceed the level of inflation. If the salary increase assumption exceeds actual future salary increases, then pension contributions will exceed the actual cost requirement and actuarial gains will develop. Alternatively, if future salary increases exceed the assumption, then pension contributions will be less than the actual cost requirement and actuarial losses will develop.

For purposes of our cost determination, we have made a reasonable allowance for general salary increases in the future. We also reflect salary increases as the result of merit, promotion, and longevity. The scale has relatively greater increases at the younger ages to correspond with the State's salary schedules. Salary scale factors at sample ages are shown below:

Age	Present Salary as a % of Age 65 Salary	Annual Increases (Rate %)
20	11.30	5.85
25	15.00	5.77
30	19.79	5.61
35	25.91	5.41
40	33.52	5.09
45	42.66	4.73
50	53.43	4.45
55	66.26	4.34
60	82.02	4.17

As noted below, the problem of salary projection has a parallel in the question of choosing an assumption as to future investment yield and the two are somewhat interrelated.

Investment Return

Investment return has a major effect on the ultimate cost of a retirement system. To demonstrate, consider an actuarially funded retirement system with investment earnings of 6 1/2% annually. If investment earnings were to increase from 6 1/2% to 8%, then the long term costs of the retirement system would be reduced by 15% to 20%.

An assumption must be made concerning future investment yields. It must be a rate that will be valid for the long-run, that is, not only for funds invested today or next year, but also for funds invested 40 or more years from now.

With the June 30, 1985 actuarial valuation, the investment return assumption was increased from 7% to 7 1/2%. This assumption allows for a moderate long term inflation rate and considers the higher rates on currently invested assets. It is also consistent with the salary scale factors discussed above.

Termination Rates

In any employee group, many employees will terminate and receive less than full benefits. Employees terminating with less than ten years of active service, for example, receive only a refund of their contributions. The termination assumption anticipates the release of State and Town funds that may have been accumulated for such people, thus resulting in a reduced ongoing cost.

The following chart provides termination rates for each cause at illustrative ages:

State Employees (Rate %)

Age	Death*	Disability	Withdrawal	Total*
20	.05	.06	21.20	21.31
25	.06	.09	15.80	15.95
30	.08	.11	11.60	11.79
35	.11	.15	8.40	8.66
40	.16	.22	6.20	6.58
45	.29	.36	4.20	4.85
50	.53	.61	2.60	3.73
55	.85	1.01	--	1.86
60	1.31	--	--	1.31

15% of the above disability rates are assumed service-connected disabilities.

Teachers (Rate %)

Age	Death*	Disability	Withdrawal	Total*
20	.05	.06	12.39	12.50
25	.06	.09	9.70	9.85
30	.08	.11	7.50	7.69
35	.11	.15	5.66	5.92
40	.16	.22	4.14	4.52
45	.29	.36	2.75	3.41
50	.53	.61	1.35	2.49
55	.85	1.01	--	1.86
60	1.31	--	--	1.31

15% of the above disability rates are assumed service-connected disabilities.

*Rates shown are for men; rates for women are slightly lower.

Note: Detail figures may not add to totals shown because of rounding.

Retirement Ages

The System provides unreduced benefits upon completion of 30 years of service for general employees and age 50 for State Correctional Officers. We assume State Employees will retire at age 63, or upon the completion of ten years of service if later. Teacher retirements are assumed to occur when the teacher has attained age 61 1/2 and completed ten or more years of service. In any case where the employee already meets these assumed conditions of age and service, it is assumed that he or she will retire immediately.

Post-Retirement Increases

Following the third anniversary of retirement, cost-of-living increases are regularly provided to pensioners. Our calculations recognize the 3 per cent annual benefit increase provided by Statute. Cost-of-living increases are now "compounded" from year to year. With this valuation we took into account the adjustment effective January 1, 1988 and all subsequent 3% increases.

Actuarial Cost Method

This valuation is performed using the Entry Age Normal Cost Method with Frozen Initial Liability, hereafter referred to as the Frozen Initial Liability Method. The change from Entry Age Normal Cost Method was legislated effective with the July 1, 1985 actuarial valuation.

Under the Frozen Initial Liability Method, the Actuarial Present Value of Benefits for all participants (including both past and future benefit accruals) is divided into three components, as follows:

(a) Assets on hand (i.e., benefits already funded);

(b) Unfunded Frozen Initial Liability, which equals the unfunded actuarial accrued liability as of June 30, 1985 based on the Entry Age Normal Cost Method, adjusted each year for expected reductions, the effect of plan amendments, and the effect of changes in actuarial assumptions; and

(c) Actuarial Present Value of Future Normal Costs, which is the balance, and which effectively includes all variations from expected experience.

The annual cost requirement consists of three items -- (1) the amount which will amortize the principal portion of the Unfunded Frozen Initial Liability over 30 years from July 1, 1986 using the sum-of-the-digits method plus (2) the interest on the outstanding balance of the Unfunded Frozen Initial Liability plus (3) the Normal Cost, which is the current annual amount which will fund the Actuarial Present Value of Future Normal Costs over the working lifetime of the active participants. The Normal Cost is calculated as a level percent of pay and the amortization payment is calculated as an increasing dollar amount. The interest cost on the outstanding balance of the Unfunded Frozen Initial Liability will decrease each year as the outstanding balance is reduced.

Overall Actuarial Basis

We believe that the actuarial assumptions, taken as a whole, are reasonable. To the extent that actual experience is better or worse than assumed, actuarial gains or losses will develop, with corresponding decreases or increases in future costs.

Missing Data

It was necessary to make certain "non-actuarial" assumptions where data was missing or incomplete with respect to some individual participants. In all cases, we assumed such individuals had the same average characteristics as other participants within the same category (e.g. male members age 37 with unknown service were assumed to have the same service distribution as male members age 37 with known service).

Table 10

Expected Number of Years of Life
Remaining at Specified Ages

Age	Male	Female
55	22.7	28.0
56	21.9	27.1
57	21.1	26.2
58	20.3	25.3
59	19.5	24.4
60	18.8	23.5
61	18.0	22.6
62	17.3	21.8
63	16.5	20.9
64	15.8	20.1
65	15.1	19.2
66	14.4	18.4
67	13.8	17.6
68	13.1	16.8
69	12.5	16.0
70	11.9	15.3
71	11.3	14.5
72	10.8	13.8
73	10.3	13.1
74	9.7	12.4
75	9.2	11.7

1971 Group Annuity Mortality Table.

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VI. RESULTS OF VALUATION

State Employees

The costs for State Employees as of June 30, 1987, including all benefit changes through that date, developed as follows:

Item	Amount	% of Payroll
(1) Participating payroll	$309,943,000	--
(2) Employer normal cost	11,954,900	3.8571%
(3) Frozen unfunded actuarial liability as of July 1, 1987	433,268,300	--
(4) Interest on unfunded actuarial liability	30,227,800	9.8
(5) Amortization payment	2,706,100	0.9

The funding statute calls for the State to contribute 100 per cent of the projected normal cost plus 100 per cent of the interest on the unfunded actuarial accrued liability (as of June 30, 1987) plus an amortization payment equal to two times 0.215% of the frozen unfunded liability as of June 30, 1985 plus the increase in liability for changes in liability of more than 1% of the outstanding unfunded liability for the 1988-89 fiscal year. Based on this requirement and a projected participating payroll of $356,100,000, the 1988-89 employer contribution "rate per cent" for State Employees is 13.6 per cent of payroll as developed below.

Item	Amount	% of Projected Payroll
(6) Projected 1988-89 participating payroll	$356,100,000	--
(7) 1988-89 employer normal cost = 3.8571% x (6)	13,735,100	3.9%
(8) Required contribution payable July 1, 1988 = 1.00 x (7) + 1.00 x (4) + 1.00 x (5)	46,669,000	13.1
(9) Required contribution payable monthly = (8) plus interest adjustment	48,419,100	13.6

The calculations, as completed through line 8 on the previous page, determine the employer contribution to be paid into the retirement fund at the beginning of each year with interest earnings starting from that date. However, contributions to the Fund are made monthly. Thus, about half a year's interest is lost, and the contribution must be increased to reflect this. Line 9 on the previous page reflects this adjustment.

The "rate per cent" of 13.6 per cent of payroll (shown on line 9) is 1.1 percentage points greater than the previous year. The reasons for the increase are shown in the following chart:

Reason	Effect on Rate Percent
Effect of early retirement incentive program (approximately 450 employees retired during fiscal 1986-87 at an age younger than expected, which caused an actuarial loss)	0.9%
Effect of improvement in benefits (primarily the effect of increasing the benefit accrual rates for employment years 21 through 33)	0.7
Effect of salary increases greater than assumed	0.3
Miscellaneous net actuarial losses (net effect of mortality, terminations, employee data records, etc.)	0.3
Investment gain during 1986-87 fiscal year	(1.1)
Total	1.1%

Teachers

The costs for Teachers as of June 30, 1987, including all benefit changes through that date, developed as follows:

Item	Amount	% of Payroll
(1) Participating payroll	$344,596,000	--
(2) Employer normal cost	15,933,000	4.6237%
(3) Frozen unfunded actuarial liability as of July 1, 1987	747,968,000	--
(4) Interest on unfunded actuarial liability	52,183,500	15.1
(5) Amortization payment	4,740,300	1.3

Applying the funding statute to the Teachers' costs and a projected participating payroll of $380,600,000 results in a contribution "rate per cent" requirement for fiscal 1988-89 of 20.3 per cent. Half of this rate (10.15%) is payable by the State and half by the municipalities. The "rate per cent" is developed as follows:

Item	Amount	% of Participating Payroll
(6) Projected 1988-89 participating payroll	$380,600,000	--
(7) 1988-89 employer normal cost = 4.6237% x (6)	17,597,800	4.6%
(8) Required contribution payable July 1, 1988 = 1.00 x (7) + 1.00 x (4) + 1.00 x (5)	74,521,600	19.6
(9) Required contribution payable monthly = (8) plus interest adjustment	77,316,200	20.3

The calculations, as completed through line 8 above, assume that the employer contributions will be paid into the retirement fund at the beginning of each fiscal year and will start to earn interest from that date. However, contributions will be deposited monthly so that approximately half a year's interest is lost, and the contribution must be increased to reflect this. Line 9 above reflects this adjustment.

The "rate per cent", measured by line 9 above, is 20.3 per cent of payroll or 1.7 percentage points greater than the 18.6 per cent for the previous year. The reasons for this increase are shown in the following chart:

Reason	Effect on Rate Percent
Effect of omission from prior year's census data of approximately 100 new retirees (thereby causing an understatement in the prior year's rate per cent)	0.8%
Effect of improvement in benefits (increasing the benefit accrual rates for employment years 21 through 33)	0.7
Effect of salary increases greater than assumed	0.5
Miscellaneous actuarial losses (net effect of mortality, retirement, terminations, employee data records, etc.)	0.4
Investment gain during 1986-87 fiscal year	(0.7)
Total	1.7%

Teacher Survivors

Because data on dependents of teachers is not available, it is not possible to do a thorough analysis of the Teachers Survivor program. However, through the use of assumed ages for members and their spouses and children, we were able to determine that the current assets of $40.3 million together with the future income will be sufficient to cover the actuarial liabilities of this program. Currently the employee and the employer each contribute one per cent of salary up to $9,600 for a maximum contribution of $192 annually. Contributions in recent years on behalf of the approximate 5,500 members have both been approximately $1 million. For the 1986-87 year, contributions totalled $1,086,000 and benefit payments were $1,115,000.

Value of Vested Benefits

The "value of vested benefits" represents the single sum value, based on the Plan's investment return, mortality, and retirement age assumptions, of all benefits to present and former employees which do not have future employment by the employee as a required condition for their receipt. Thus, it includes the present value of an immediate or deferred pension for all pensioners, beneficiaries, and active participants with at least ten years of service. For active employees with less than ten years of service and inactive vested employees, only the accumulated employee contributions are included.

For the Employees' Retirement System, the value of vested benefits as of June 30, 1987 is as follows:

	State Employees	Teachers
Active members	$374,978,600	$ 551,241,900
Inactive members	6,930,900	6,541,500
Retired members	508,854,700	445,174,800
Total value of vested benefits	$890,764,200	$1,002,958,200
Assets at actuarial value	616,195,100	648,705,500
Unfunded value of vested benefits	$274,569,100	$ 354,252,700

Disclosure Information Required by G.A.S.B. Statement #5

For plan years beginning after December 15, 1986, the Plan is subject to the disclosure requirements of Statement No. 5 of the Governmental Accounting Standards Board (G.A.S.B.).

The Statement requires the calculation of a standardized measure called the "pension benefit obligation" which is independent of the actuarial funding method. This amount is the actuarial present value of credited projected benefits pro-rated on service. It differs from the previously reported "value of vested benefits" because the value of non-vested benefits is included, future salary increases are taken into account and because of the pro-ration of benefits uniformly over an employee's total projected service.

The pension benefit obligation as of June 30, 1987 for State Employees has been determined to be $1,018,159,200. Approximately 49% of this amount is attributable to benefits on behalf of active employees with the balance (51%) attributable to the benefits of retirees and inactive employees. For Teachers the pension benefit obligation as of June 30, 1987 is $1,309,066,100. Of this amount approximately 65% is attributable to active employees and the remaining 35% is attributable to benefits on behalf of pensioners, beneficiaries and inactive employees. Exhibit II of the attached actuarial valuation certificate provides additional detail regarding this new disclosure amount.

Overall Status of System

Legislation in January, 1979 effectively returned the System to its former statutory funding schedule beginning with the 1979-80 fiscal year. (Actually, the accelerated funding provided for by the General Assembly in 1978 was never used as the basis for determining contributions as its effective date was deferred for one year to July 1, 1979, by which date the further revision of the law superseded it.)

As the funding law currently exists, beginning with the fiscal year starting July 1, 1986, the statutory contribution comprises the normal cost, amortization of the June 30, 1985 unfunded liability and certain changes in that liability based on the sum-of-the-digits method over 30 years, and interest on the outstanding balance of the unfunded liability.

We believe that the funding program as set forth in the state statute is a reasonable basis for funding the Rhode Island Retirement System. If the statutory funding program is followed without change, the System will be fully funded--that is, the assets will equal the actuarial liability on June 30, 2016. In the interim, the assets are projected to be sufficient at all times to meet the cash requirements for projected benefit payments.

APPENDIX

MODEL FORM SUMMARY STATEMENT RE CITY AND TOWN PARTICIPATION IN TEACHERS' RETIREMENT SYSTEM FOR PURPOSES OF FINANCIAL STATEMENTS AND REPORTS, MUNICIPAL BOND REGISTRATION STATEMENTS, ETC.

The (city) (town) of ____________ provides retirement benefits to its public school teachers through its participation in the Rhode Island Retirement System, a statutory, mandatory, state-wide, multi-employer retirement system, which first covered Rhode Island teachers on July 1, 1949. This System is administered as a unified state-wide system by the State Retirement Board, the composition of which is set forth in the pertinent state statute. The assets are held in the custody of the State Treasurer as an undivided single fund.

The actuarial costs of the retirement benefits are partially funded by employee contributions of 8 1/2 per cent of pay effective July 1, 1986. The net employer actuarial costs are determined annually by the actuary and as provided by statute are certified by the Retirement Board to the Department of Administration as a rate per cent of payroll, payable one half by the State of Rhode Island and one half by the (city) (town). The statute provided for increasing graduated percentages of the annual normal cost and interest on the unfunded liability until the year beginning July 1, 1986 when the full normal cost and amortization payments on a 30-year schedule are required.

Actuarial valuations prepared by Martin E. Segal Company, applying the entry age normal cost method with the frozen initial liability, assuming 7 1/2 per cent interest return on invested assets and applying assumed rates of salary progression, allowance for post-retirement increases and other actuarial assumptions--all as set forth in the published annual reports of the Retirement Board--reveal the following comparative highlights of the last three years for the Teachers' System as a whole:

	Year Beginning July 1, 1985	1986	1987
Active participants	10,016	9,886	10,307
Pensioners and beneficiaries	3,167	3,261	3,414
Inactive participants	1,946	2,030	2,006
Liability for accrued vested benefits	$776,178,300	$856,938,500	$1,002,958,200
Net assets at actuarial value for 1987, 1986 and 1985	417,985,200	533,018,300	648,705,500

As shown in State's financial statements:

	Year Ended June 30, 1985	1986	1987
Employer contributions	$ 52,886,808	$ 60,405,655	$ 60,558,867
Member contributions	20,584,746	24,932,383	27,757,328
Total contributions	$ 73,471,555	$ 85,338,038	$ 88,316,194
Net miscellaneous income	121,384	312,202	332,766
Investment income	32,639,521	47,947,261	52,810,779
Total income available for benefit payments	$106,232,459	$133,597,501	$141,459,740
Benefit payments	34,417,225	37,444,543	46,271,415
Excess of income over expenses	$ 71,815,234	$ 96,152,959	$ 95,188,325

Note: Detail figures may not add to totals shown because of rounding.

Actuarial costs and liabilities, as shown in the summary presentation, are determined in the aggregate for the Teachers System. Accordingly, employer contributions are first determined in the aggregate for all participating employers in this multi-employer system; are then expressed as a rate per cent of the aggregate participating payroll; and one half this rate per cent is then promulgated to each participating employer as the actuarial cost factor to be applied to its participating payroll (the remaining one half of the employer cost is contributed by the State).

Employer contributions by (city) (town) of ____________ for each of the last two years (together with the amount for the current year, based on the promulgated rate per cent of 9.30 per cent) are as follows:

	Year Ending June 30,		
	1985	1986	1987 (est.)
Participating payroll			
Employer contributions			

With respect to the Teachers Retirement System, Martin E. Segal Company, independent actuaries advising the Retirement Board have stated on March 31, 1988:

> "We believe that the funding program set forth in the state statute is a reasonable basis for funding the Rhode Island Teachers Retirement System. If the statutory funding program is followed without change, the System will be fully funded--that is, the assets will equal the actuarial liability on June 30, 2016. In the interim the assets are projected to be sufficient at all times to meet the cash requirements for projected benefit payments."

According to the statutory funding schedule, the contributions required each year of the (city) (town) of ____________ and the State will remain relatively level as a percent of payroll as the System moves toward funding the full actuarial liability. Ultimately, however, because the actuarial funding results in the accumulation of reserves that are invested, the required appropriation will be significantly less than would be required if this System were on a pay-as-you-go basis.

MARTIN E. SEGAL COMPANY
CONSULTANTS AND ACTUARIES

607 BOYLSTON STREET
BOSTON, MASSACHUSETTS 02116
(617) 262-0550

March 31, 1988

EMPLOYEES' RETIREMENT SYSTEM OF THE STATE OF RHODE ISLAND

CERTIFICATE OF ACTUARIAL VALUATION

This is to certify that we have prepared an actuarial valuation of the plan as of June 30, 1987.

This certificate contains the following attached exhibits:

EXHIBIT I - Actuarial Cost Development of Fiscal Year 1988-89 Contribution Percentage
- A. State Employees
- B. Teachers

EXHIBIT II - Pension Benefit Obligation

EXHIBIT III - Actuarial Assumptions and Cost Method

EXHIBIT IV - Summary of Plan Provisions

To the best of my knowledge, the information supplied in this actuarial valuation is complete and accurate (except as noted in Exhibit I) and in my opinion the assumptions used in the aggregate (a) are reasonably related to the experience of the plan and to reasonable expectations and (b) represent my best estimate of anticipated experience under the plan.

MARTIN E. SEGAL COMPANY, INCORPORATED

By: James R. Laws
James R. Laws, F.S.A., M.A.A.A.
Vice President and Actuary

JRL/hva
D98

EXHIBIT I

ACTUARIAL COST FOR DEVELOPMENT OF
FISCAL YEAR 1988-89 CONTRIBUTION PERCENTAGE

A. STATE EMPLOYEES

The valuation was made with respect to the following data supplied to us by the Retirement Board:

a. 14,375 active participants (including 6,640 fully vested) with total annual salaries of $309,943,000

b. 1,843 inactive participants

c. 7,062 pensioners (including 495 beneficiaries of deceased pensioners and active employees)

The actuarial factors as of the valuation date are as follows:

1.	Actuarial present value of benefits - total		$1,358,436,200
	Active employees	$842,650,600	
	Inactive employees	6,930,900	
	Pensioners and beneficiaries	508,854,700	
2.	Actuarial value of assets		616,195,100
3.	Present value of future employee contributions		201,186,400
4.	Unfunded frozen actuarial liability		433,268,300
5.	Actuarial present value of future normal costs (item 1 - item 2 - item 3 - item 4)		107,786,400
6.	Actuarial present value of future compensation		2,682,485,800
7.	Normal cost percentage (item 5 / item 6)		4.02%
8.	Total compensation of employees below the assumed retirement age		$297,386,700
9.	Normal cost (item 7 x item 8)		11,954,900
10.	Interest on unfunded frozen actuarial liability		30,227,800
11.	Payment required to amortize unfunded frozen actuarial liability over 30 years (28 years remaining from July 1, 1988) in installments which increase in multiples of 0.215% per year		2,706,100
12.	Total annual cost if paid on July 1, 1987 (item 9 plus item 10 plus item 11)		44,888,800

(Continued...)

13.	Total annual cost if paid in uniform installments throughout the year (item 12 plus one-half year's interest)	$46,572,100
14.	Total annual cost based on 1988-89 projected participating payroll of $356,100,000 if paid in uniform installments throughout the year	48,419,100
15.	Item 14 amount as a percent of payroll	13.6%

Present value of accrued vested benefits: $890,764,200

Ratio of actuarial value of assets (line 2) to actuarial accrued liability ($1,073,228,600): 57.42%

Note: Included are 96 active employees unknown as to age, service, or both. Status of beneficiaries was unclear. The liability included for inactive employees is the sum of their accumulated contributions.

EXHIBIT I

ACTUARIAL COST FOR DEVELOPMENT OF
FISCAL YEAR 1988-89 CONTRIBUTION PERCENTAGE

B. TEACHERS

The valuation was made with respect to the following data supplied to us by the Retirement Board:

a. 10,307 active participants (including 7,766 fully vested) with total annual salaries of $344,596,000

b. 2,006 inactive participants

c. 3,414 pensioners (including 138 beneficiaries of deceased pensioners and active employees)

The actuarial factors as of the valuation date are as follows:

1.	Actuarial present value of benefits - total		$1,868,065,500
	Active employees	$1,416,349,200	
	Inactive employees	6,541,500	
	Pensioners and beneficiaries	445,174,800	
2.	Actuarial value of assets		648,705,500
3.	Present value of future employee contributions		301,346,500
4.	Unfunded frozen actuarial liability		747,968,000
5.	Actuarial present value of future normal costs (item 1 - item 2 - item 3 - item 4)		170,045,500
6.	Actuarial present value of future compensation		3,545,252,800
7.	Normal cost percentage (item 5 / item 6)		4.80%
8.	Total compensation of employees below the assumed retirement age		$331,937,400
9.	Normal cost (item 7 x item 8)		15,933,000
10.	Interest on unfunded frozen actuarial liability		52,183,500
11.	Payment required to amortize unfunded frozen actuarial liability over 30 years (28 years remaining from July 1, 1988) in installments which increase in multiples of 0.215% per year		4,740,300
12.	Total annual cost if paid on July 1, 1987 (item 9 plus item 10 plus item 11)		72,856,800

(Continued...)

EXHIBIT I

ACTUARIAL COST FOR DEVELOPMENT OF
FISCAL YEAR 1988-89 CONTRIBUTION PERCENTAGE

B. TEACHERS
(Continued)

13.	Total annual cost if paid in uniform installments throughout the year (item 12 plus one-half year's interest)	$75,588,900
14.	Total annual cost based on 1988-89 projected participating payroll of $380,600,000 if paid in uniform installments throughout the year	77,316,200
15.	Item 14 as a percent of payroll	20.3%

Present value of accrued vested benefits: $1,002,958,200

Ratio of actuarial value of assets (line 2) to actuarial accrued liability ($1,472,388,100): 44.06%

Note: Included are 381 active employees unknown as to age, service, or both. Status of beneficiaries was unclear. The liability included for inactive employees is the sum of their accumulated contributions.

EXHIBIT II

PENSION BENEFIT OBLIGATION

The value of the pension benefit obligation required for disclosure by Statement No. 5 of the Governmental Accounting Standards Board is shown below as of June 30, 1987.

	Pension Benefit Obligation	
	State Employees	Teachers
1) Participants currently receiving benefits and terminated employees not yet receiving benefits	$ 515,785,600	$ 451,716,300
2) Current employees		
Accumulated employee contributions	122,843,800	191,396,100
Employer-financed vested	315,565,800	630,762,400
Employer-financed nonvested	63,964,000	35,191,300
3) Total pension benefit obligation	$1,018,159,200	$1,309,066,100

EXHIBIT III

ACTUARIAL ASSUMPTIONS AND COST METHOD

Mortality rates -- 1971 Group Annuity Mortality Table

Disability mortality before age 65 -- Age 65 mortality under stipulated table

Termination rates before retirement:

State Employees (Rate %)

Age	Death*	Disability	Withdrawal	Total*
20	.05	.06	21.20	21.31
25	.06	.09	15.80	15.95
30	.08	.11	11.60	11.79
35	.11	.15	8.40	8.66
40	.16	.22	6.20	6.58
45	.29	.36	4.20	4.85
50	.53	.61	2.60	3.73
55	.85	1.01	--	1.86
60	1.31	--	--	1.31

15% of the above disability rates are assumed service-connected.

Teachers (Rate %)

Age	Death*	Disability	Withdrawal	Total*
20	.05	.06	12.39	12.50
25	.06	.09	9.70	9.85
30	.08	.11	7.50	7.69
35	.11	.15	5.66	5.92
40	.16	.22	4.14	4.52
45	.29	.36	2.75	3.41
50	.53	.61	1.35	2.49
55	.85	1.01	--	1.86
60	1.31	--	--	1.31

15% of the above disability rates are assumed service-connected.

*Rates shown for men; rates for women are slightly lower.

Note: Detail rates may not add to totals shown due to rounding.

Salary scale:

Age	Present salary as a % of salary at 65	Annual increase (Rate %)
20	11.30	5.85
25	15.00	5.77
30	19.79	5.61
35	25.91	5.41
40	33.52	5.09
45	42.66	4.73
50	53.43	4.45
55	66.26	4.34
60	82.02	4.17

Includes allowance for inflation of 4% per year.

Unknown characteristics of employees: Same as those exhibited by employees with known characteristics. Unknown salary is assumed to be $20,000 for State Employees and $25,000 for Teachers.

Retirement age -- State Employees: 63, or completion of service requirement, if later. Teachers: 61 1/2, or completion of service requirement, if later.

Post-retirement increases -- 3% compounded annually

Percent married -- Social Security awards during 1972

Net investment return -- 7 1/2%

Actuarial value of assets --

Sum of Preliminary Value and write-up, but no more than 120% of market value or less than 80% of market value. Preliminary Value is actuarial value of assets at beginning of the year plus increase in cost value during the year, excluding realized capital gains or losses. Write-up is 20% of market value at end of year in excess of preliminary value.

If Preliminary Value exceeds market value, there is a write-down of assets determined in a similar manner.

Actuarial cost method -- Frozen initial liability method. The method is also referred to as the entry age normal cost method with frozen initial liability.

Entry age is the employee's age at the time he or she would have commenced employment if the plan had always been in existence.

Frozen actuarial liability calculated on an individual basis and the outstanding balance of the unfunded amount is based on expected value regardless of actual contributions. It is funded over the 30-year period ended June 30, 2016. Payment on outstanding balance of unfunded frozen initial liability based on sum of (1) interest on outstanding balance, and (2) a payment towards principal. The principal portion of the payment is based on the sum-of-the-digits amortization method.

EXHIBIT IV

SUMMARY OF PLAN PROVISIONS

Service pension

	General Employees		Correctional Officers	Legislators	
Age requirement:	60	None	50	55	None
	or			or	
Service requirement:	10 yrs.	30 yrs.	20 yrs.	8 yrs.	20 yrs.

Amount: 1.7% of final average salary up to 10 years of service plus 1.9% per year for the next 10 years of service plus 3% for the next 14 years of service plus 2% for the 35th year. The maximum benefit is 80% of final average salary after 35 years of service. Final average salary is defined as the average of compensation earned during the highest 3 consecutive years prior to termination. Correctional officers receive 2% of final average salary for each of the first 30 years of service plus 6% for the 31st year plus 5% for the 32nd year plus 4% for the 33rd year plus 3% for the 34th year plus 2% for the 35th year. Legislators receive $600 per year of service to a maximum of $12,000.

Disability

Non-occupational:

Age requirement: None
Service requirement: 5 years
Amount: Regular pension based on service accrued and final average salary at disability, payable immediately. The minimum retirement percentage is 17% regardless of service.

Occupational:

Age requirement: None
Service requirement: None
Amount: 66 2/3% of final salary, payable immediately.

Vesting

Age requirement: None
Service requirement: 10 years
Amount: Regular pension accrued, payable at age 60.

Pre-retirement death benefits

Lump sum benefit:

Age requirement: None
Service requirement: None
Amount: Sum of (a) $800 per year of service to a maximum of $16,000 and with a minimum of $4,000, and
(b) Refund of employee contributions.

Joint and Survivor benefit (applicable only if elected by employee):

Age requirement: None
Service requirement: 10 years / Legislators: 8 years
Amount: Benefit employee would have received had he retired the day before he died and elected the joint and survivor option.

Occupational death benefit:

Age requirement: None
Service requirement: None
Amount: Sum of (a) 50% of salary to spouse or children under age 18, less workmen's compensation, and
(b) Refund of employee contributions.

Post-retirement death benefit

Lump sum benefit: Sum of (a) 100% of employee contributions, less benefits paid, and
(b) Pre-retirement death benefit, reduced 25% per year of retirement, but not less than $4,000.

Employee contribution rate:

Date	State Employees	Teachers	Legislators
Prior to 7/1/79	5%	6%	30%
7/1/79 - 6/30/82	5 1/2	6 1/2	30
7/1/82 - 6/30/85	6	7	30
7/1/85 - 6/30/86	7	8	30
7/1/86 and later	7 1/2	8 1/2	30

Available options:

Joint and survivor with 50% or 100% continued to the beneficiary after the death of the employee, Social Security.

Post-retirement cost-of-living increases:

3% of current amount, compounded, to pensioners and beneficiaries following the third anniversary of retirement.