

*Report
of the
Actuary*

MARTIN E. SEGAL COMPANY
INCORPORATED

607 BOYLSTON STREET • BOSTON, MASS. 02116 • (617) 262-0550

March 19, 1980

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

Dear Members of the Board:

We are pleased to submit herewith our Actuarial Valuation of the Employees' Retirement System as of June 30, 1979.

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. Joseph G. Iannelli, Executive Director; Mr. John F. Sullivan, Assistant Director; and Mr. Carlo Mencucci, Principal 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:

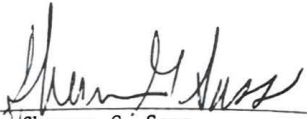
- I. SUMMARY
- II. EMPLOYEE DATA
- III. RETIREE DATA
- IV. RETIREMENT FUND
- V. ACTUARIAL ASSUMPTIONS AND METHODS
- VI. RESULTS OF VALUATION

Following the report, we have attached 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 yours,

MARTIN E. SEGAL COMPANY

By 
 Sherman G. Sass
 Senior Vice President

By 
 Sherman B. Lieberman, F.S.A., M.A.A.A.
 Actuary

SGS/kmj

I. SUMMARY

Benefit Provisions

The Employees' Retirement System 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 5 1/2* per cent of their annual earnings; Teachers contribute 6 1/2* per cent.

The System provides unreduced benefits of 1.7 per cent of earnings for the first ten years of service; 1.9 per cent for the next ten years; and 2.4 per cent per year of service over 20 years up to a maximum of 80 per cent of earnings for all years of service. Such benefits are available to members at least age 55 with 30 years of service or age 60 with 10 years of service, or after 35 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 year of service. Benefits are based on the average of the highest 3 consecutive years' earnings. After the third anniversary of retirement, "cost-of-living increases" amounting to 3 per cent per year of the original award are provided, independent of actual changes in the Consumer Price Index.

The plan also provides non-service-connected disability and vested benefits after 7 and 10 years of service, respectively; service-connected disability pensions with no minimum service requirement; widow's benefits for service-connected death; and certain lump sum death benefits.

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

*These rates are scheduled to increase by 0.5 per cent on July 1, 1982 and again on July 1, 1985 (these dates were revised from July 1, 1980 and July 1, 1981 respectively, as a result of legislation enacted January, 1980).

Employee Data

We received data on 15,746 active State Employees and 11,520 Teachers as of June 30, 1979 who were participating in the system. The average salary was \$12,600 for State Employees and \$17,500 for Teachers. On the average, the State Employees were age 43 and had 8 1/2 years of service; Teachers were age 39 1/2 with 11 years of service.

Retiree Data

We received data on 4,097 State Employee pensioners and 150 beneficiaries as of June 30, 1979. The pensioners' average monthly benefit was \$286. There were 2,714 retired Teachers and 63 beneficiaries; the average benefit was \$560 a month for the pensioners. Of all the pensioners on the rolls, 8 per cent had retired in the year ended June 30, 1979.

Retirement Fund

As of June 30, 1979, the Fund had assets of \$352 million available as an offset to the actuarial liabilities for future benefits.

Actuarial Valuation

Our valuation was prepared as of June 30, 1979. Our calculations were based on what we believe are reasonable assumptions as to expected future experience. The assumptions are the same as those used in our previous actuarial valuation. We used the "entry age normal cost" method of funding, which spreads the cost of each employee's pension on a level percentage of his earnings from date of hire to retirement.

The employer normal cost* for State Employees is \$10.1 million. This is 5.1 per cent of the payroll of participating State Employees.

*Please refer to the "Actuarial Assumptions and Methods" section of the report for definitions of these terms.

The employer normal cost for Teachers is \$8.6 million or 4.3 per cent of payroll.

For State Employees, the actuarial liability* (for benefits earned before July 1, 1979) is \$458 million of which \$156 million represents the liability to those already receiving pensions. The unfunded actuarial liability at the end of the year is \$273 million. For Teachers, the actuarial liability is \$586 million of which \$195 million is for those receiving pensions. The unfunded actuarial liability stands at \$436 million.

The value of the System's vested benefits is \$845 million. Thus the assets are short of this amount by \$511 million (excluding assets allocable to the Teachers Survivors' program).

Based on the normal cost plus 30-year amortization of the unfunded actuarial liability, the annual employer cost as of June 30, 1979 is \$31 million (15.5 per cent of covered payroll) for State Employees and \$41 million (20.5 per cent of covered payroll) for Teachers. These amounts are in addition to the required employee contributions.

In fiscal 1980-81, the State's statutory funding schedule, as amended effective July 1, 1979, calls for 81 per cent of the normal cost and 55 per cent of the interest on the unfunded actuarial liability to be contributed. This amounts to 8.5 per cent of the projected 1980-81 payroll for State Employees and 10.8 per cent of projected payroll for Teachers. (Half of this cost for Teachers is paid for by the municipalities.) According to the statute as amended, the percentages of normal cost and interest on the unfunded liability required to be contributed are scheduled to increase until fiscal 1985-86 and then in later years the full normal cost and 30-year amortization of unfunded liabilities will be required.

*See note on page 2.

II. EMPLOYEE DATA

We received data on 15,746 State Employees and 11,520 Teachers participating in the System on June 30, 1979. The data included age, service, sex, and salary for each participant. The average salary of the participants was \$12,600 for State Employees and \$17,500 for Teachers. The data included 361 Correctional Officers and 123 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 \$10,000 for the State Employees for whom earnings were missing. A \$15,000 annual salary was imputed for Teachers with unknown compensation.

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, average salary for State employees increased by 2.4 per cent while Teachers' average salary increased by 8.0 per cent. Aggregate payroll increased by 3.9 per cent and 14.7 per cent for State Employees and Teachers, respectively.

Overall, the data was in excellent condition. We recommend that the Board continue to pursue its program of storing all basic information on participants on computer files.

Table 1A
Number and Average Salaries of Employees in Active Service
as of June 30, 1979
by Age and by Years of Service
STATE EMPLOYEES

Age	Total	Years of service										35 and over	Unknown
		0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 and over	Unknown			
Total	15,746 \$12,600	6,199 \$11,200	4,581 \$12,000	2,270 \$13,400	1,205 \$15,000	684 \$16,200	377 \$17,300	221 \$18,200	100 \$19,600	109 \$12,400			
Under 20	119 \$ 8,700	118 \$ 8,800	--	--	--	--	--	--	--	--	--	--	1 \$ 6,400
20 - 24	1,392 9,600	1,259 9,600	126 \$ 9,400	--	--	--	--	--	--	--	--	--	7 9,400
25 - 29	2,098 11,400	1,328 11,400	693 11,400	69 \$11,000	--	--	--	--	--	--	--	--	8 11,600
30 - 34	1,931 13,600	903 12,900	766 14,400	240 13,800	19 \$12,600	--	--	--	--	--	--	--	3 12,700
35 - 39	1,274 13,400	515 12,200	409 13,200	253 15,800	89 15,500	6 \$14,100	--	--	--	--	--	--	2 9,100
40 - 44	1,336 13,200	479 11,900	393 11,900	208 14,600	167 17,700	69 15,300	17 \$14,000	--	--	--	--	--	3 12,000
45 - 49	1,626 13,000	517 11,400	488 11,800	261 13,800	155 16,000	127 17,300	58 15,500	13 \$14,500	--	--	--	--	7 14,800
50 - 54	2,010 13,100	489 11,100	595 11,100	405 13,300	216 15,600	132 18,100	92 17,900	66 \$16,700	10 17,200	5 \$23,500	7 17,000	25 21,000	5 26,800
55 - 59	2,107 12,800	421 10,900	602 11,100	429 12,500	254 13,800	187 16,100	111 17,900	71 17,500	43 21,000	5 26,800	1 22,400	60 9,700	
60 - 64	1,448 13,000	157 11,400	424 11,000	316 12,600	243 13,100	126 13,200	77 18,200	57 19,100	43 21,000	5 26,800	1 22,400		
65 and over	334 14,200	7 5,900	82 11,600	87 12,300	62 15,000	37 17,200	22 15,400	14 21,200	22 21,000	1 22,400			
Unknown	71 9,600	6 8,400	3 8,400	2 13,700	--	--	--	--	--	--	--	--	60 9,700

Table 1B
 Number and Average Salaries of Employees in Active Service
 as of June 30, 1979
 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	11,520 \$17,500	1,737 \$13,300	4,639 \$17,000	2,531 \$18,800	1,208 \$19,600	777 \$20,400	357 \$21,100	155 \$21,000	84 \$20,000	32 \$15,000
Under 20	1 \$19,700	--	--	--	--	--	--	--	--	1 \$19,700
20 - 24	159 10,300	148 \$10,300	9 \$10,800	--	--	--	--	--	--	2 10,400
25 - 29	2,051 13,900	925 12,500	1,115 15,100	5 \$12,700	--	--	--	--	--	6 13,000
30 - 34	3,021 17,200	295 14,600	2,090 17,100	627 18,600	--	--	--	--	--	9 15,700
35 - 39	1,786 18,400	157 15,100	550 18,200	846 18,900	229 \$19,600	1 \$25,000	--	--	--	3 13,500
40 - 44	1,195 19,100	103 15,700	291 18,600	316 18,800	361 20,300	124 20,200	--	--	--	--
45 - 49	1,050 19,300	53 16,000	246 17,600	248 19,000	218 19,700	225 21,300	60 \$20,700	--	--	--
50 - 54	1,001 19,600	33 17,500	194 18,400	244 18,800	146 19,500	183 20,600	152 21,700	47 \$20,300	1 \$ 700	1 \$20,300
55 - 59	722 19,500	14 16,700	99 18,300	148 18,600	147 19,000	136 19,900	90 21,200	69 21,100	19 21,400	--
60 - 64	383 19,200	6 15,500	38 19,000	72 18,300	69 19,100	83 19,400	38 19,400	24 21,800	53 19,500	--
65 and over	131 19,000	--	4 18,700	21 17,800	38 17,900	25 18,300	17 20,300	15 21,300	11 21,500	--
Unknown	20 15,500	3 14,000	3 17,100	4 14,500	--	--	--	--	--	10 15,900

Table 2A
 Statistical Data on Active State Employees
 On June 30, 1979 and 1978

	June 30, 1979	June 30, 1978
Number of covered employees	15,746	15,543
Total annual salary	\$197,959,700	\$190,451,300
Average annual salary	\$12,600	\$12,300
Average age	43	43
Average years of service	8½	8½
Number eligible for service retirement	1,291	1,242
Number vested but not eligible to retire	3,566	3,357

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Table 2B
 Statistical Data on Active Teachers
 On June 30, 1979 and 1978

	June 30, 1979	June 30, 1978
Number of covered employees	11,520	10,850
Total annual salary	\$201,933,900	\$176,022,900
Average annual salary	\$17,500	\$16,200
Average age	39½	39
Average years of service	11	10½
Number eligible for service retirement	602	460
Number vested but not eligible to retire	4,510	3,864

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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:

	<u>State Employees</u>	<u>Teachers</u>
Pensioners:		
Number	4,097	2,714
Average age	70	72
Average monthly benefit	\$286	\$560
Beneficiaries:		
Number	150	63
Average age	77½	76½
Average monthly benefit	\$216	\$367

Table 3A gives distributions of the 344 new State Employee pensions in the current year by type of pension and amount. Table 4A does the same for age at retirement. Tables 3B and 4B are similar for the 178 new Teacher pensions.

Tables 5A and 5B give distributions for all pensions in force at the end of the fiscal year by type and amount. Tables 6A and 6B do the same by age.

The data on retirees was reasonably good for retired employees. However, it was inadequate to be certain that beneficiaries were classified correctly.

The data on terminated employees with vested rights was not adequate to calculate a cost for them.

We recommend that this information be maintained by this system so that it can be incorporated in the next review.

Table 3A

Pensions Awarded in the Year Ended June 30, 1979
by Type and by Monthly Amount

STATE EMPLOYEES

Monthly amount	Total	Type of pension			
		Service	Ordinary disability	Accidental disability	Legislator
Total	344	296	35	1	12
Under \$50	1	1	--	--	--
\$ 50 - 99	19	16	2	1	--
100 - 149	42	41	1	--	--
150 - 199	48	38	10	--	--
200 - 249	43	36	6	--	1
250 - 299	31	27	2	--	2
300 - 349	24	17	5	--	2
350 - 399	15	11	4	--	--
400 - 449	20	17	--	--	3
450 - 499	14	11	3	--	--
500 - 599	26	20	2	--	4
600 - 699	17	17	--	--	--
700 - 799	8	8	--	--	--
800 - 899	4	4	--	--	--
900 - 999	6	6	--	--	--
1,000 - 1,099	5	5	--	--	--
1,100 - 1,199	6	6	--	--	--
1,200 - 1,299	2	2	--	--	--
1,300 - 1,399	3	3	--	--	--
1,400 - 1,499	3	3	--	--	--
1,500 - 1,999	6	6	--	--	--
2,500 - 2,999	1	1	--	--	--

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Table 3B

Pensions Awarded in the Year Ended June 30, 1979
by Type and by Monthly Amount

TEACHERS

Monthly amount	Total	Type of pension		
		Service	Ordinary disability	Accidental disability
Total	178	171	5	2
Under \$50	1	1	--	--
\$ 50 - 99	1	1	--	--
100 - 149	3	3	--	--
150 - 199	3	3	--	--
200 - 249	5	5	--	--
250 - 299	6	6	--	--
300 - 349	6	6	--	--
350 - 399	10	8	2	--
400 - 449	5	4	1	--
450 - 499	7	7	--	--
500 - 599	17	17	--	--
600 - 699	16	16	--	--
700 - 799	13	12	1	--
800 - 899	14	14	--	--
900 - 999	18	15	1	2
1,000 - 1,099	16	16	--	--
1,100 - 1,199	24	24	--	--
1,200 - 1,299	6	6	--	--
1,300 - 1,399	3	3	--	--
1,500 - 1,999	4	4	--	--

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Table 4A
Pensions Awarded in the Year Ended June 30, 1979
by Type and by Age on Effective Date
STATE EMPLOYEES

Age on effective date	Total	Type of pension			
		Service	Ordinary disability	Accidental disability	Legislator
Total	344	296	35	1	12
25 - 29	1	--	1	--	--
35 - 39	1	--	--	1	--
45 - 49	6	--	5	--	1
50	1	1	--	--	--
51	1	--	1	--	--
52	2	2	--	--	--
53	3	2	1	--	--
54	3	1	2	--	--
55	7	3	3	--	1
56	5	1	3	--	1
57	9	3	4	--	2
58	7	1	5	--	1
59	6	3	2	--	1
60	35	33	--	--	2
61	23	23	--	--	--
62	50	50	--	--	--
63	28	26	1	--	1
64	32	29	2	--	1
65	52	48	3	--	1
66	20	19	1	--	--
67	10	10	--	--	--
68	13	12	1	--	--
69	12	12	--	--	--
70 and over	17	17	--	--	--

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Table 4B
Pensions Awarded in the Year Ended June 30, 1979
by Type and by Age on Effective Date
TEACHERS

Age on effective date	Total	Type of pension		
		Service	Ordinary disability	Accidental disability
Total	178	171	5	2
35 - 39	1	--	1	--
45 - 49	1	--	--	1
53	1	--	1	--
54	2	1	1	--
55	8	8	--	--
56	1	1	--	--
57	10	9	1	--
58	4	3	1	--
59	8	8	--	--
60	42	42	--	--
61	12	11	--	1
62	19	19	--	--
63	8	8	--	--
64	14	14	--	--
65	17	17	--	--
66	4	4	--	--
67	6	6	--	--
68	8	8	--	--
69	6	6	--	--
70 and over	6	6	--	--

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Table 5A
Pensions in Force on June 30, 1979
by Type and by Monthly Amount
STATE EMPLOYEES

Monthly amount	Total	Type of pension				
		Service	Ordinary accidental	Accidental disability	Legislator	Beneficiary
Total	4,247	3,583	320	69	125	150
Under \$50	138	118	5	7	--	8
\$ 50 - 99	707	645	28	7	--	27
100 - 149	780	670	81	8	--	21
150 - 199	567	454	81	6	--	26
200 - 249	428	332	45	4	20	27
250 - 299	308	247	25	5	24	7
300 - 349	233	178	17	6	19	13
350 - 399	169	138	16	8	3	4
400 - 449	160	131	5	2	19	3
450 - 499	110	91	3	3	7	6
500 - 599	210	157	10	8	33	2
600 - 699	112	104	4	1	--	3
700 - 799	83	78	--	3	--	2
800 - 899	62	61	--	1	--	--
900 - 999	48	47	--	--	--	1
1,000 - 1,099	36	36	--	--	--	--
1,100 - 1,199	31	31	--	--	--	--
1,200 - 1,299	22	22	--	--	--	--
1,300 - 1,399	15	15	--	--	--	--
1,400 - 1,499	8	8	--	--	--	--
1,500 - 1,999	17	17	--	--	--	--
2,000 - 2,499	2	2	--	--	--	--
2,500 - 2,999	1	1	--	--	--	--

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Table 5B

Pensions in Force on June 30, 1979
by Type and by Monthly Amount
TEACHERS

Monthly amount	Total	Type of pension			
		Service	Ordinary disability	Accidental disability	Beneficiary
Total	2,777	2,628	76	10	63
Under \$50	3	3	--	--	--
\$ 50 - 99	18	17	--	--	1
100 - 149	56	50	2	--	4
150 - 199	124	105	12	--	7
200 - 249	115	93	10	1	11
250 - 299	126	111	9	--	6
300 - 349	149	132	11	--	6
350 - 399	215	202	7	--	6
400 - 449	443	431	7	--	5
450 - 499	161	154	5	--	2
500 - 599	285	275	5	1	4
600 - 699	298	288	4	--	6
700 - 799	280	272	3	1	4
800 - 899	176	173	--	2	1
900 - 999	141	136	1	4	--
1,000 - 1,099	84	83	--	1	--
1,100 - 1,199	51	51	--	--	--
1,200 - 1,299	25	25	--	--	--
1,300 - 1,399	13	13	--	--	--
1,400 - 1,499	3	3	--	--	--
1,500 - 1,999	10	10	--	--	--
2,000 - 2,499	1	1	--	--	--

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Table 6A

Pensions in Force on June 30, 1979
by Type and by Age

STATE EMPLOYEES

Age on June 30, 1979	Total	Type of pension				
		Service	Ordinary disability	Accidental disability	Legislator	Beneficiary
Total	4,247	3,583	320	69	125	150
25 - 29	4	--	3	--	--	1
30 - 34	3	--	2	--	--	1
35 - 39	6	--	4	2	--	--
40 - 44	7	--	4	1	1	1
45 - 49	21	1	13	6	1	--
50 - 54	61	11	34	10	3	3
55 - 59	163	51	74	14	20	4
60 - 64	683	550	91	10	25	7
65 - 69	1,164	1,063	51	18	24	8
70 - 74	1,054	971	35	7	20	21
75 - 79	649	586	8	1	14	40
80 - 84	280	237	--	--	12	31
85 - 89	111	82	--	--	3	26
90 - 94	33	25	--	--	2	6
95 - 99	6	4	1	--	--	1
100 - 104	1	1	--	--	--	--
105 - 109	1	1	--	--	--	--

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Table 6B

Pensions in Force on June 30, 1979
by Type and by Age

TEACHERS

Age on June 30, 1979	Total	Type of pension			
		Service	Ordinary disability	Accidental disability	Beneficiary
Total	2,777	2,628	76	10	63
35 - 39	1	--	1	--	--
40 - 44	3	--	3	--	--
45 - 49	2	--	2	--	--
50 - 54	17	2	9	2	4
55 - 59	72	54	14	3	1
60 - 64	372	348	16	5	3
65 - 69	658	643	11	--	4
70 - 74	761	745	6	--	10
75 - 79	447	423	8	--	16
80 - 84	276	256	5	--	15
85 - 89	128	120	1	--	7
90 - 94	33	31	--	--	2
95 - 99	6	5	--	--	1
100 - 104	1	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, 1979.

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 out of 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 gives a summary of income and expenditures for the years ended June 30, 1979 and 1978.

At June 30, 1979 assets totalled \$352 million. Table 8 gives a breakdown of the assets and compares them to those of the previous year. About 74 per cent of the fund was invested in fixed income securities such as bonds and notes.

The Financial statements indicate that 53 per cent of the assets relate to State Employees, 42 per cent are for Teachers, and 5 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 for 1979 and 1978.

Table 7

Summary Statement of Income and Expenses
For the Years Ended June 30, 1979 and 1978

	<u>1979</u>	<u>1978</u>
Employer contributions	\$27,614,392	\$36,852,360
Member contributions	22,622,537	19,982,000
Total contributions	50,236,928	56,834,360
Less: Administration expenses	64	470
Net contribution income	50,236,865	56,833,890
Net miscellaneous items	(1,669,334)	115,495
Investment income:		
Dividends	\$ 5,068,905	
Interest	19,598,731	
Capital gains and losses	28,544	
Net investment income	24,696,180	19,961,329
Total income available for benefit payments	\$73,263,710	\$76,910,714
Benefit payments:		
Pension benefits	\$37,009,659	\$33,387,955
Death benefits	1,124,882	1,099,609
Contribution refunds	2,931,934	2,901,243
Total benefit payments	41,066,475	37,388,807
Excess of income over expenses	\$32,197,235	\$39,521,907

Note: Detail figures may not add to totals due to rounding.

Table 8
Assets as of June 30, 1979 and 1978

	<u>1979</u>	<u>1978</u>
Cash	\$ 1,489,537	\$ 2,076,229
Accrued interest receivable	4,502,823	3,984,800
Investments		
Government bonds	\$ 85,046,258	\$ 65,669,661
Corporate bonds	125,435,933	125,213,267
Common and preferred stocks	83,989,480	73,558,000
Certificates of deposit	10,450,000	11,337,778
Short-term notes	43,299,814	39,122,263
(Less) Unamortized premiums and discounts	<u>(2,592,089)</u>	<u>(1,537,474)</u>
Total assets	<u>\$351,621,757</u>	<u>\$319,424,522</u>

Note: Detail figures may not add to totals due to rounding.

RHODE ISLAND ERS

Table 9
Allocation of Assets by Plan
as of June 30, 1979 and 1978

	<u>1979</u>	<u>1978</u>
State Employees:		
Employer reserves	\$125,132,771	\$114,973,981
Member reserves	<u>59,579,454</u>	<u>53,550,703</u>
Total State Employees reserves	\$184,712,225	\$168,524,685
Teachers:		
Employer reserves	\$ 66,700,955	\$ 60,994,394
Member reserves	<u>82,681,551</u>	<u>74,255,436</u>
Total Teacher reserves	149,382,506	135,249,831
Teachers Survivors:		
Employer reserves	\$ 12,403,499	\$ 10,972,310
Member reserves	<u>5,062,656</u>	<u>4,638,361</u>
Total Teachers Survivors reserves	17,466,156	15,610,671
Unallocated:		
Unclaimed benefit reserve	<u>60,871</u>	<u>39,336</u>
Total assets	<u>\$351,621,757</u>	<u>\$319,424,522</u>

Note: Detail figures may not add to totals due to rounding.

RHODE ISLAND ERS

V. ACTUARIAL ASSUMPTIONS AND METHODS

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 services that give rise to the pension obligation. The result is an employer contribution which anticipates future payments. A fund accumulates which earns investment income, thus reducing the ultimate cost.

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. These assumptions are the same as those used in the June 30, 1978 study.

Mortality Rates

We assumed that mortality rates would conform with the 1971 Group Annuity Mortality Table. This is a recently published table of pension plan mortality, and we believe it will be a reasonable basis for experience under the System. It is one of the tables in general use in valuing pension plans in the United States. Table 10 gives some life expectancies after retirement.

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 normal 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 was young and a lower per cent of his higher salary at a later age. By use of a salary projection, the contribution for an individual, all other things remaining the same, tends to stay at the same percentage over the years.

How to project future salaries is a major policy question. To what extent should one seek to anticipate, through present contributions, the full impact on pension costs of future salary changes?

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

<u>Age</u>	<u>Present Salary as a % of Age 65 Salary</u>	<u>Annual Increases (Rate %)</u>
20	17.45	4.84
25	22.07	4.75
30	27.76	4.59
35	34.62	4.39
40	42.68	4.08
45	51.76	3.72
50	61.77	3.45
55	72.98	3.33
60	86.08	3.16

As will appear, 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.

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.

We assumed that terminations each year from all causes except retirement would be as follows:

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

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

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

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

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

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

Retirement Ages

The System provides unreduced benefits as early as age 55 for general employees and 50 for State Correctional Officers. We have assumed State Employees will retire at age 64, or completion of 10 years of service if later. Teacher retirements are assumed to occur when the teacher is both age 63 and has 10 or more years of service. In any case where the employee already meets these assumed conditions of age and service, it is projected 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 calculation assumed 3 per cent annual benefit increases as provided by Statute. It should be noted that cost-of-living increases are based on the original pension award; they are not "compounded" from year to year.

Investment Return

Investment return has a major effect on the ultimate cost of a retirement system. In general, if a system is actuarially funded (so that it has a substantial reserve which is earning an investment yield), a yield of 6 per cent - in contrast to a 5 per cent yield - will reduce costs by 16-20 per cent.

An assumption must be made concerning future yields. It must be a rate that will be valid for the long-run, that is, not only for money invested today or next year, but also for money invested 10 and 20 years from now.

We selected an investment return assumption of 6 1/2 per cent per year for our calculation. This assumption takes account of probable moderate long-term inflation but is not tied directly to the higher rates currently available.

Funding Method

We have used the "entry age normal cost" method of funding. This method spreads the cost of the benefits to be provided to an individual as a level percentage of his pay from his date of employment to his assumed date of retirement. The normal cost for the entire system is equal to the sum of the normal costs for all participants. In a rough sense, it can be visualized as the cost of benefits earned during the current year.

The actuarial liability represents the amount by which the future normal costs fall short of meeting the cost of future benefit payments. It can also be viewed, roughly, as the value of benefits accrued for service prior to the valuation date.

Overall Actuarial Basis

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

Missing Data

It was also necessary to make certain "non-actuarial" assumptions where data was missing or incomplete. In all cases, we assumed such individuals had the same characteristics as other participants, taking into account the known characteristics (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		
56	22.7	28.0
57	21.9	27.1
58	21.1	26.2
59	20.3	25.3
	19.5	24.4
60		
61	18.8	23.5
62	18.0	22.6
63	17.3	21.8
64	16.5	20.9
	15.8	20.1
65		
66	15.1	19.2
67	14.4	18.4
68	13.8	17.6
69	13.1	16.8
	12.5	16.0
70		
71	11.9	15.3
72	11.3	14.5
73	10.8	13.8
74	10.3	13.1
	9.7	12.4
75		
	9.2	11.7

1971 Group Annuity Mortality Table.

VI. RESULTS OF VALUATION

State Employees

The costs for State Employees as of June 30, 1979, developed as follows:

Item	Amount	% of Payroll
(1) Participating payroll	\$197,959,700	--
(2) Employer normal cost	10,054,800	5.1%
(3) Unfunded actuarial liability	273,380,600	--
(4) Amortization of unfunded actuarial liability --		
(a) Interest	16,685,200	8.4
(b) Principal (30 year amortization)	2,972,600	1.5
(c) Total (30 year funding)	19,657,800	9.9
(5) Total annual cost if paid July 1, 1979 --		
(a) Interest only = (2) + (4a)	26,740,000	13.5
(b) 30 year funding = (2) + (4c)	29,712,600	15.0
(6) Total annual cost if paid monthly = (5) plus ½ year interest --		
(a) Interest only	27,609,000	13.9
(b) 30 year funding	30,678,300	15.5

The revised funding statute calls for the State to contribute 81 per cent of the projected normal cost plus 55 per cent of the interest on the unfunded actuarial liability (as of June 30, 1979) for the 1980-81 fiscal year. Based on this requirement and a projected participating payroll of \$222,000,000, the 1980-81 employer contribution "rate per cent" for State Employees is 8.5 per cent of payroll, developed as follows:

Item	Amount	% of Projected Payroll
(7) Projected 1980-81 participating payroll	\$222,000,000	--
(8) 1980-81 employer normal cost = 5.1% x (7)	11,275,800	5.1%
(9) Required contribution if paid July 1, 1980 = .81 x (8) + .55 x (4a)	18,310,300	8.2
(10) Required contribution if paid monthly = (9) plus ½ year interest	18,905,400	8.5

The calculations as completed assume that the employer contribution will be paid into the retirement fund at the beginning of each year, and will start to earn interest from that date. In fact, the money is deposited monthly. Thus about half a year's interest is lost, and the contribution must be increased to reflect this. Lines 6 and 10, on the previous page, include this adjustment.

The "full cost" of the System's benefits (Line 6b) is 15.5 per cent of payroll which compares to 15.4 per cent for the previous year, (adjusted to take into account the 0.5 per cent increase in the employee contribution rate effective July 1, 1979). The small increase in cost is due primarily to the fact that last year's statutory contribution represented only a portion of the "full cost" for that year.

Teachers

The costs for Teachers as of June 30, 1979, developed as follows:

Item	Amount	% of Payroll
(1) Participating payroll		--
(2) Employer normal cost	\$201,933,900	--
(3) Unfunded actuarial liability	8,631,500	4.3%
(4) Amortization of unfunded actuarial liability --	436,187,100	--
(a) Interest	26,621,800	13.2
(b) Principal (30 year amortization)	4,742,800	2.3
(c) Total (30 year funding)	31,364,600	15.5
(5) Total annual cost if paid July 1, 1979 -		
(a) Interest only = (2) + (4a)	35,253,300	17.5
(b) 30 year funding = (2) + (4c)	39,996,100	19.8
(6) Total annual cost if paid January, 1980 = (5) plus ½ year interest --		
(a) Interest only	36,399,000	18.0
(b) 30 year funding	41,296,000	20.5

Applying the revised funding statute to the Teachers' costs and a projected participating payroll of \$209,374,000, gives a contribution "rate per cent" requirement for fiscal 1980-81 of 10.8 per cent. Half of this (5.4%) is payable by the State and half by the municipalities. The "rate per cent" is developed as follows:

<u>Item</u>	<u>Amount</u>	<u>% of Participating Payroll</u>
(7) Projected 1980-81 participating payroll	\$209,374,000	--
(8) 1980-81 employer normal cost = 4.3% x (7)	8,949,500	4.3%
(9) Required contribution if paid July 1, 1980 = .81 x (8) + .55 x (4a)	21,891,100	10.5
(10) Required contribution if paid January, 1980 = (9) plus ½ year interest	22,602,600	10.8

The calculations as completed assume that the employer contribution will be paid into the retirement fund at the beginning of each year, and will start to earn interest from that date. In fact, the money is deposited in January. Thus about half a year's interest is lost, and the contribution must be increased to reflect this. Lines 6 and 10, above, include this adjustment.

The "full cost" is 20.5 per cent of payroll which compares to 20.1 per cent for the previous year (adjusted to take into account the 0.5 per cent increase in the employee contribution rate effective July 1, 1979). In addition to the reason given above for State Employees, the cost increase can be attributed to actuarial losses from salary increases in excess of the assumed rates.

Teachers Survivors

Because we do not have data on dependents of teachers, it is difficult to do a detailed analysis of the Teachers Survivor program.

However, we have attempted to estimate the actuarial position based on "high cost" assumptions. For example, we assumed 25 per cent of teachers would be unmarried at death in active service, 10 per cent would be married but childless, and 65 per cent would be married with children (two children, one born when the wife was age 23 and the other at age 32). On this rough basis, the assets appear to be sufficient to fully cover the actuarial liabilities. The normal cost is estimated to be between \$110 and \$125 per person -- well within the \$192 combined annual employer-employee contribution (each pays 1 per cent of the first \$9,600 of salary).

Based on this analysis, we believe the present contribution is adequate to support the plan of benefits.

Value of Vested Benefits

In private pension plans, it is customary for the actuary to provide the "value of vested benefits." This figure is used by accountants in preparing financial statements, both as a disclosure item and as a factor in determining the pension expense charge, in accordance with Opinion No. 8 of the Accounting Principles Board of the American Institute of Certified Public Accountants, "Accounting for the Cost of Pension Plans." While we recognize that the State may not be covered by this Opinion, a brief discussion of this subject may be helpful.

The "value of vested benefits" represents the single premium value under the plan's investment income and mortality 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, vested former employees, and active participants with at least ten years of service. For active employees with less than ten years of service, only the accumulated employee contributions are included, since that is all such employees would receive if they had no further employment.

For the Employees' Retirement System, the value of vested benefits as of June 30, 1979 is as follows:

	<u>State Employees</u>	<u>Teachers</u>
Active members	\$240,475,200	\$253,018,300
Retired members	<u>156,372,400</u>	<u>194,930,600</u>
Total value of vested benefits	\$396,847,600	\$447,948,900
Assets	<u>184,712,200</u>	<u>149,382,500</u>
Unfunded value of vested benefits	<u>\$212,135,400</u>	<u>\$298,566,400</u>

Overall Status of System

Legislation in January, 1979 effectively returned the System to its former statutory funding schedule beginning with the fiscal 1979-80 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 in the law superseded it.)

Under the funding law as amended, the State and the Teacher Employers will not begin to pay the full normal cost and the amortization payment until the fiscal year beginning July 1, 1986. Thus, for fiscal 1980-81, as reported earlier, the employer cost is 81 per cent of the normal cost and 55 per cent of the interest payment on the unfunded liability. The percentage totals in the schedule increase each year:

<u>Fiscal year beginning on July 1</u>	<u>Current service cost</u>	<u>Interest on unfunded liability</u>
1980	81%	55%
1981	86%	65%
1982	91%	75%
1983	95%	85%
1984	100% and thereafter	95%
1985		100% and thereafter

Beginning with the fiscal year starting July 1, 1986 the statutory contribution remains at the normal cost plus amortization of the remaining unfunded liability over 30 years.

* * * * *

MARTIN E. SEGAL COMPANY
INCORPORATED

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March 19, 1980

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, 1979.

The certificate contains the following attached exhibits:

EXHIBIT I - Actuarial Cost for Year Beginning July 1, 1979

A. State Employees

B. Teachers

EXHIBIT II - Actuarial Assumptions and Funding Method

EXHIBIT III - 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

Sherman B. Lieberman

By: Sherman B. Lieberman, F.S.A., M.A.A.A.
Actuary

EXHIBIT I
ACTUARIAL COST FOR YEAR BEGINNING JULY 1, 1979

A. STATE EMPLOYEES

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

- a. 15,746 active participants (including 4,857 fully vested) with total annual salaries of \$197,959,700
- b. 4,247 pensioners (including 150 beneficiaries of deceased pensioners and active employees)

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

1. Total normal cost	
2. Projected employee contributions	\$ 20,942,600
3. Employer normal cost	10,887,800
4. Actuarial liability - total	10,054,800
Active employees	458,092,800
Pensioners (including beneficiaries of deceased pensioners and active employees)	\$301,720,400
5. Assets	156,372,400
6. Unfunded actuarial liability	184,712,200
	273,380,600

Liability for accrued vested benefits: \$396,847,600

Note: Included are 120 active employees unknown as to age, service, or both. Status of beneficiaries was unclear. No data was provided on terminated vested employees, if any.

EXHIBIT I
ACTUARIAL COST FOR YEAR BEGINNING JULY 1, 1979

B. TEACHERS

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

- a. 11,520 active participants (including 5,112 fully vested) with total annual salaries of \$201,933,900
- b. 2,777 pensioners (including 63 beneficiaries of deceased pensioners and active employees)

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

1. Total normal cost	\$ 21,757,200
2. Projected employee contributions	13,125,700
3. Employer normal cost	8,631,500
4. Actuarial liability - total	585,569,600
Active employees	\$390,639,000
Pensioners (including beneficiaries of deceased pensioners and active employees) ...	194,930,600
5. Assets	149,382,500
6. Unfunded actuarial liability	436,187,100
Liability for accrued vested benefits: \$447,948,900	

Note: Included are 42 active employees unknown as to age, service, or both. Status of beneficiaries was unclear. No data was provided on terminated vested employees, if any.

EXHIBIT II
ACTUARIAL ASSUMPTIONS AND FUNDING METHOD

Mortality rates -- 1971 Group Annuity Mortality Table

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

Termination rates before retirement:

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

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

Age	Death*	Teachers (Rate %)		Total*
		Disability	Withdrawal	
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 service-connected.

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

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

Salary scale:

Age	Present salary as a percent of salary at 65	Annual increase (Rate %)
		4.84
20	17.45	4.75
25	22.07	4.59
30	27.76	4.39
35	34.62	4.08
40	42.68	3.72
45	51.76	3.45
50	61.77	3.33
55	72.98	3.16
60	86.08	

Includes allowance for inflation of 3% per year

Unknown characteristics of employees: Same as those exhibited by employees with known characteristics. Unknown salary is assumed to be \$10,000 for State Employees and \$15,000 for Teachers.
 Retirement age -- State Employees: 64, or completion of service requirement if later. Teachers: 63, or completion of service requirement if later.
 Post-retirement increases -- 3% per annum, based on original benefit
 Percent married -- Social Security awards during 1972
 Net investment return -- 6½%
 Valuation of assets -- At amortized book value for bonds and at cost for stocks.
 Funding method -- Entry age normal cost.

EXHIBIT III
 SUMMARY OF PLAN PROVISIONS

Service pension

	General Employees			Correctional Officers	Legislators	
Age requirement:	60	55	None	50	55	None
Service requirement:	10 yrs.	30 yrs.	35 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 2.4% for each additional year of service to a maximum of 80%. 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 per year of service. Legislators receive \$300 per year of service to a maximum of \$6,000. Retirement is mandatory at age 70 except for elected officials. For correctional officers, mandatory retirement is at age 55 or completion of 20 years of service if later.

Early retirement

Age requirement: None
 Service requirement: 30 years
 Amount: Regular pension accrued, reduced by 6% for each year of age less than 55.

Disability

Non-occupational:

Age requirement: None
 Service requirement: 7 years
 Amount: Regular pension based on service accrued and final average salary at disability (but not less than 26.5%), payable immediately.

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: (a) \$400 per year of service to a maximum of \$8,000
and with a minimum of \$2,000.
(b) Refund of employee contributions.

Spouse's benefit (applicable only if elected by employee):

Age requirement: 60 50 Legislators: none
or
Service requirement: 10 yrs. 20 yrs. 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: (a) 50% of salary to spouse or children under age 18,
less workmen's compensation.
(b) Refund of employee contributions.

Post-retirement death benefit

Lump sum benefit:

- (a) 100% of employee contributions, less benefits paid.
- (b) Pre-retirement death benefit, reduced 25% per year of retirement, but not less than \$2,000.

Employee contribution rate:

Date	State Employees	Teachers	Legislators
Prior to 7/1/79	5 %	6 %	30
7/1/79 - 6/30/82	5½	6½	30
7/1/82 - 6/30/85	6	7	30
7/1/85 and later	6½	7½	30

Available options:

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

Post-retirement cost-of-living increases:

3% of original amount, not compounded, to pensioners and beneficiaries following the third anniversary of retirement. No cost-of-living increases to legislators.