

*Report
of the
Actuary*

MARTIN E. SEGAL COMPANY
INCORPORATED

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

ATLANTA
CHICAGO
CLEVELAND
DALLAS
DENVER
HARTFORD
HOUSTON
LOS ANGELES
NEW ORLEANS
NEW YORK
PHOENIX
SAN FRANCISCO
WASHINGTON, D. C.
TORONTO

January 28, 1981

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 of the State of Rhode Island as of June 30, 1980.

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.

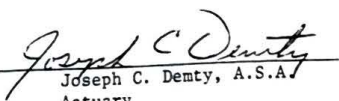
Sincerely yours,

MARTIN E. SEGAL COMPANY

By


Sherman G. Sass
Senior Vice President

By


Joseph C. Denty, A.S.A.
Actuary

SGS/lf

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 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 three 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. Beginning January 1, 1981, the cost-of-living increases are computed at the rate of 3 per cent compounded annually.

The plan also provides non-service-connected disability and vested benefits after five and ten 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 16,104 active State Employees and 11,177 Teachers as of June 30, 1980 who were participating in the System. The average salary was \$13,500 for State Employees and \$17,600 for Teachers. On the average, the State Employees were age 43 and had 8 1/2 years of service; Teachers were age 40 with 12 years of service.

Retiree Data

We received data on 4,415 State Employee pensioners and 154 beneficiaries as of June 30, 1980. The pensioners' average monthly benefit was \$354. There were 2,824 retired Teachers and 61 beneficiaries; the average benefit was \$737 a month for the pensioners. The benefit amounts include an adjustment for the cost-of-living provision. Of all the pensioners on the rolls, 9 per cent had retired in the year ended June 30, 1980.

Retirement Fund

As of June 30, 1980, the Fund had assets of \$401 million available as an offset to the actuarial liabilities for future benefits.

Actuarial Valuation

Our valuation was prepared as of June 30, 1980. Our calculations were based on 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 as a level percentage of his earnings from date of hire to retirement.

The employer normal cost* for State Employees is \$11.9 million. This represents 5.4 per cent of the reported payroll of participating State Employees as of June 30, 1980. The employer normal cost for Teachers is \$9.2 million or 4.7 per cent of reported payroll.

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

For State Employees, the accrued actuarial liability* (for benefits earned before July 1, 1980) is \$555 million, of which \$205 million represents the liability to those already receiving pensions. The unfunded accrued actuarial liability at the end of the year is \$345 million. For Teachers, the accrued actuarial liability is \$695 million of which \$262 million is for those receiving pensions. The unfunded accrued actuarial liability stands at \$525 million.

The value of the System's vested benefits is \$1.01 billion. Thus the assets are short of this amount by \$626 million (excluding assets allocable to the Teachers Survivors' program).

In fiscal 1981-82, the State's statutory funding schedule, as amended effective July 1, 1979, calls for 86 per cent of the normal cost and 65 per cent of the interest on the unfunded accrued actuarial liability to be contributed. This amounts to 10.4 per cent of the projected 1981-82 payroll for State Employees and 13.2 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 amortization of unfunded liabilities will be required.

*See note on page 2.

II. EMPLOYEE DATA

We received data on 16,104 State Employees and 11,177 Teachers participating in the System on June 30, 1980. The data included age, service, sex, and salary for each participant. The average salary of the participants was \$13,500 for State Employees and \$17,600 for Teachers. The data included 358 Correctional Officers and 98 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 7.1 per cent while Teachers' average salary increased by 0.6 per cent. Aggregate payroll increased by 10.1 per cent for State Employees and decreased 2.8 per cent for Teachers.

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 1 A
Number and Average Salaries of Employees in Active Service
As of June 30, 1980
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			
Total	16,104 \$13,500	6,147 \$12,000	4,753 \$13,100	2,424 \$14,200	1,190 \$16,000	701 \$17,900	383 \$18,800	223 \$20,100	102 \$20,700	181 \$12,100	
Under 20	121 \$ 9,300	121 \$ 9,300	--	--	--	--	--	--	--	--	
20 - 24	1,268 10,300	1,127 10,300	126 10,400	--	--	--	--	--	--	15 \$10,100	
25 - 29	2,201 12,100	1,345 12,200	775 12,000	64 \$12,000	--	--	--	--	--	17 12,500	
30 - 34	2,090 14,400	913 13,400	833 15,400	306 14,800	18 \$13,500	--	--	--	--	20 13,000	
35 - 39	1,475 14,400	591 13,000	461 14,400	288 16,700	114 16,700	10 \$14,000	--	--	--	11 15,100	
40 - 44	1,334 14,100	441 12,500	434 12,900	207 15,200	165 18,600	67 17,200	14 \$16,400	--	--	6 11,600	
45 - 49	1,624 14,100	506 12,200	495 13,100	269 14,600	149 16,800	121 19,600	60 17,000	14 \$18,600	--	10 14,400	
50 - 54	1,993 14,100	483 12,100	576 12,500	413 13,800	208 16,200	150 19,600	84 18,900	57 19,200	10 \$15,500	12 15,500	
55 - 59	2,147 13,900	432 11,700	567 12,100	477 13,300	249 14,800	201 17,300	107 20,000	80 20,700	28 19,200	6 19,500	
60 - 64	1,398 14,000	164 12,600	403 11,900	292 13,100	226 14,600	118 15,100	92 18,300	58 21,100	39 20,900	6 19,800	
65 and over	355 15,500	7 11,200	80 12,700	108 12,700	61 16,000	34 19,400	26 20,500	14 18,300	25 24,000	--	
Unknown	98 9,800	17 10,000	3 6,500	--	--	--	--	--	--	78 9,900	

Table 1B
 Number and Average Salaries of Employees in Active Service
 As of June 30, 1980
 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	11,177 \$17,600	1,146 \$12,800	4,185 \$16,400	3,072 \$18,700	1,277 \$19,500	824 \$20,300	394 \$21,300	177 \$21,100	72 \$20,200	30 \$16,100
Under 20	2 \$18,900	--	--	--	--	--	--	--	--	2 \$18,900
20 - 24	42 10,500	37 \$10,500	3 \$ 8,200	--	--	--	--	--	--	2 14,200
25 - 29	1,467 13,100	603 11,500	854 14,200	4 12,300	--	--	--	--	--	6 13,800
30 - 34	3,195 16,800	228 14,000	2,074 16,400	887 18,300	--	--	--	--	--	6 17,400
35 - 39	1,885 18,400	110 14,500	503 17,700	994 18,000	273 \$19,200	1 \$25,000	--	--	--	4 13,500
40 - 44	1,251 19,000	83 15,000	277 18,000	363 18,800	390 20,200	136 20,200	2 \$17,700	--	--	--
45 - 49	1,036 19,300	41 15,300	204 17,500	261 19,000	205 20,000	249 20,900	76 20,300	--	--	--
50 - 54	1,022 19,400	27 16,300	145 18,000	296 18,900	154 18,800	191 20,500	148 22,400	59 \$20,000	1 \$ 700	1 20,300
55 - 59	733 19,600	13 17,800	87 18,100	168 18,900	135 19,200	128 19,900	114 21,300	69 20,900	19 20,700	--
60 - 64	407 19,400	3 17,000	31 18,000	82 18,600	87 18,800	90 19,400	41 19,800	29 23,500	44 20,200	--
65 and over	119 19,100	-- --	2 19,300	14 17,300	33 18,000	29 18,500	13 19,000	20 22,000	8 21,300	--
Unknown	18 16,000	1 14,400	5 15,800	3 13,400	--	--	--	--	--	9 17,200

RHODE ISLAND ERS

Table 2A
 Statistical Data on Active State Employees
 On June 30, 1980 and 1979

	June 30, 1980	June 30, 1979
Number of covered employees	16,104	15,746
Total annual salary	\$218,021,200	\$197,959,700
Average annual salary	\$13,500	\$12,600
Average age	43	43
Average years of service	8 1/2	8 1/2
Number eligible for service retirement	1,282	1,291
Number vested but not eligible to retire	3,741	3,566

RHODE ISLAND ERS

Table 2B
 Statistical Data on Active Teachers
 On June 30, 1980 and 1979

	June 30, 1980	June 30, 1979
Number of covered employees	11,177	11,520
Total annual salary	\$196,305,300	\$201,933,900
Average annual salary	\$17,600	\$17,500
Average age	40	39½
Average years of service	12	11
Number eligible for service retirement	638	602
Number vested but not eligible to retire	5,178	4,510

RHODE ISLAND ERS

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	4,415	2,824
Average age	70	72
Average monthly benefit	\$354	\$737
Beneficiaries:		
Number	154	61
Average age	78	77
Average monthly benefit	\$340	\$543

Table 3A gives distributions of the 426 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 203 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 again recommend that this information be maintained by the System so that it can be incorporated in the next review.

Table 3A
Pensions Awarded in the Year Ended June 30, 1980
By Type and By Monthly Amount
STATE EMPLOYEES

Monthly amount	Total	Type of pension				
		Service	Ordinary disability	Accidental disability	Legislator	Beneficiary
Total	426	376	33	8	6	3
Under \$50	7	5	--	2	--	--
\$ 50 - \$ 99	18	14	1	3	--	--
100 - 149	47	46	--	1	--	--
150 - 199	62	57	5	--	--	--
200 - 249	51	36	12	--	3	--
250 - 299	34	27	5	1	1	--
300 - 349	30	27	3	--	--	--
350 - 399	25	24	1	--	--	--
400 - 449	18	17	1	--	--	--
450 - 499	17	14	--	--	1	2
500 - 599	33	30	1	--	1	1
600 - 699	22	18	3	1	--	--
700 - 799	10	10	--	--	--	--
800 - 899	15	15	--	--	--	--
900 - 999	5	4	1	--	--	--
1,000 - 1,099	9	9	--	--	--	--
1,100 - 1,199	4	4	--	--	--	--
1,200 - 1,299	6	6	--	--	--	--
1,300 - 1,399	2	2	--	--	--	--
1,400 - 1,499	4	4	--	--	--	--
1,500 - 1,999	5	5	--	--	--	--
2,000 - 2,499	2	2	--	--	--	--

RHODE ISLAND ERS

Table 3B
Pensions Awarded in the Year Ended June 30, 1980
By Type and By Monthly Amount
TEACHERS

Monthly amount	Total	Type of pension		
		Service	Ordinary disability	Accidental disability
Total	203	194	8	1
Under \$50	1	1	--	--
\$ 100 - 149	1	1	--	--
150 - 199	1	1	--	--
200 - 249	4	4	--	--
250 - 299	3	3	--	--
300 - 349	3	2	1	--
350 - 399	5	4	1	--
400 - 449	8	6	2	--
450 - 499	5	5	--	--
500 - 599	21	20	1	--
600 - 699	14	14	--	--
700 - 799	12	11	1	--
800 - 899	24	22	2	--
900 - 999	26	26	--	--
1,000 - 1,099	17	17	--	--
1,100 - 1,199	25	24	--	1
1,200 - 1,299	11	11	--	--
1,300 - 1,399	10	10	--	--
1,400 - 1,499	2	2	--	--
1,500 - 1,999	8	8	--	--
2,000 - 2,499	2	2	--	--

RHODE ISLAND ERS

Table 4A
Pensions Awarded in the Year Ended June 30, 1980
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	426	376	33	8	6	3
30 - 34	1	--	--	1	--	--
35 - 39	1	--	--	1	--	--
40 - 44	3	1	1	--	1	--
45 - 49	6	1	3	2	--	--
50	2	1	1	--	--	--
51	2	1	--	1	--	--
52	16	--	1	1	--	--
53	5	2	3	--	--	--
54	5	2	1	1	--	1
55	9	4	1	--	4	--
56	7	6	1	--	--	--
57	37	1	2	--	--	--
58	7	4	2	1	--	--
59	11	3	8	--	--	--
60	42	41	1	--	--	--
61	40	40	--	--	--	--
62	228	69	1	--	--	--
63	40	37	3	--	--	--
64	36	32	3	--	1	--
65	48	48	--	--	--	--
66	22	22	--	--	--	2
67	106	10	--	--	--	--
68	11	11	--	--	--	--
69	13	13	--	--	--	--
70 and over	28	27	1	--	--	--

RHODE ISLAND ERS

Table 4B
Pensions Awarded in the Year Ended June 30, 1980
By Type and By Age on Effective Date
TEACHERS

Age on Effective date	Total	Type of pension		
		Service	Ordinary disability	Accidental disability
Total	203	194	8	1
35 - 39	2	--	--	--
40 - 44	2	2	2	--
45 - 49	2	--	--	--
55	5	5	--	--
56	9	8	1	--
57	39	5	1	--
58	12	9	3	--
59	8	8	--	--
60	39	39	--	--
61	105	28	--	--
62	18	18	--	--
63	10	10	--	--
64	10	10	--	--
65	16	16	--	--
66	47	11	--	--
67	8	8	--	--
68	6	6	--	--
69	6	6	--	--
70 and over	6	6	--	--

RHODE ISLAND ERS

Table 5A
Pensions in Force on June 30, 1980
by Type and by Monthly Amount
STATE EMPLOYEES

Monthly amount	Total	Type of pension				
		Service	Ordinary disability	Accidental disability	Legislator	Beneficiary
Total	4,569	3,863	351	78	123	154
Under \$50	59	49	—	9	—	1
\$ 50 - 99	372	327	26	8	—	11
100 - 149	776	711	44	7	—	14
150 - 199	653	525	103	5	—	20
200 - 249	504	402	68	7	7	20
250 - 299	372	296	35	4	24	13
300 - 349	262	211	19	3	15	14
350 - 399	228	185	14	4	9	16
400 - 449	199	161	11	8	10	9
450 - 499	149	113	9	6	15	6
500 - 599	302	241	8	8	32	13
600 - 699	171	150	8	4	5	4
700 - 799	115	101	4	4	1	5
800 - 899	73	67	—	—	3	3
900 - 999	78	72	1	1	2	2
1,000 - 1,099	64	62	1	—	—	1
1,100 - 1,199	46	45	—	—	—	1
1,200 - 1,299	38	37	—	—	—	1
1,300 - 1,399	34	34	—	—	—	—
1,400 - 1,499	27	27	—	—	—	—
1,500 - 1,999	39	39	—	—	—	—
2,000 - 2,499	7	7	—	—	—	—
2,500 - 2,999	1	1	—	—	—	—

RHODE ISLAND ERS

Table 5B
Pensions in Force on June 30, 1980
by Type and by Monthly Amount
TEACHERS

Monthly amount	Total	Type of pension			
		Service	Ordinary disability	Accidental disability	Beneficiary
Total	2,885	2,729	84	11	61
Under \$50	2	2	—	—	—
\$ 50 - 99	7	7	—	—	—
100 - 149	21	21	—	—	—
150 - 199	40	36	1	—	3
200 - 249	71	66	3	—	2
250 - 299	76	61	5	—	10
300 - 349	110	98	10	—	2
350 - 399	113	97	12	—	4
400 - 449	106	89	14	—	3
450 - 499	114	101	5	—	8
500 - 599	266	242	13	1	10
600 - 699	395	384	9	—	2
700 - 799	410	400	3	1	6
800 - 899	369	358	6	1	4
900 - 999	311	300	3	5	3
1,000 - 1,099	186	183	—	2	1
1,100 - 1,199	108	105	—	1	2
1,200 - 1,299	78	77	—	—	1
1,300 - 1,399	36	36	—	—	—
1,400 - 1,499	25	25	—	—	—
1,500 - 1,999	37	37	—	—	—
2,000 - 2,499	4	4	—	—	—

RHODE ISLAND ERS

Table 6A

Pensions in Force on June 30, 1980
by Type and by Age

STATE EMPLOYEES

Age on June 30, 1980	Total	Type of pension				
		Service	Ordinary disability	Accidental disability	Legislator	Beneficiary
Total	4,569	3,863	351	78	123	154
25 - 29	3	--	3	--	--	--
30 - 34	3	--	1	1	--	1
35 - 39	8	--	5	3	--	--
40 - 44	7	1	2	2	2	--
45 - 49	25	2	15	6	1	1
50 - 54	68	13	37	13	2	3
55 - 59	178	64	76	13	20	5
60 - 64	742	598	101	12	23	8
65 - 69	1,252	1,131	64	19	29	9
70 - 74	1,128	1,050	36	6	17	19
75 - 79	683	622	10	3	13	35
80 - 84	304	262	--	--	11	31
85 - 89	121	86	--	--	4	31
90 - 94	39	29	--	--	1	9
95 - 99	7	4	1	--	--	2
100 - 104	1	1	--	--	--	--

RHODE ISLAND ERS

Table 6B

Pensions in Force on June 30, 1980
by Type and by Age

TEACHERS

Age on June 30, 1980	Total	Type of pension			
		Service	Ordinary disability	Accidental disability	Beneficiary
Total	2,885	2,729	84	11	61
35 - 39	3	--	2	1	--
40 - 44	4	2	2	--	--
45 - 49	4	--	4	--	--
50 - 54	14	1	7	2	4
55 - 59	91	65	23	2	1
60 - 64	390	370	12	5	3
65 - 69	642	625	12	1	4
70 - 74	778	761	8	--	9
75 - 79	496	478	5	--	13
80 - 84	277	253	8	--	16
85 - 89	142	132	1	--	9
90 - 94	36	35	--	--	1
95 - 99	7	6	--	--	1
100 - 104	1	1	--	--	--

RHODE ISLAND ERS

IV. RETIREMENT FUND

The State maintains the Employees' Retirement Fund. The Retirement Board provided us with financial statements as of June 30, 1980.

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, 1980 and 1979.

At June 30, 1980 assets totalled \$401 million. Table 8 shows the composition of the assets and compares them to those of the previous year. About 75 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 1980 and 1979.

Table 7

Summary Statement of Income and Expenses
For the Years Ended June 30, 1980 and 1979

	<u>1980</u>	<u>1979</u>
Employer contributions	\$36,223,195	
Member contributions	<u>26,057,643</u>	\$27,614,392
Total contributions	\$62,280,838	<u>22,622,537</u>
Less: Administration expenses	<u>200</u>	\$50,236,928
Net contribution income	\$62,280,638	<u>64</u>
Net miscellaneous items	148,418	\$50,236,865
Investment income:		(1,669,334)
Dividends	\$ 5,954,361	
Interest	25,858,886	\$ 5,068,905
Capital gains and losses	<u>259,866</u>	19,598,731
Net investment income	<u>32,073,113</u>	<u>28,544</u>
Total income available for benefit payments	\$94,502,169	<u>24,696,180</u>
Benefit payments:		
Pension benefits	\$41,087,642	\$37,009,659
Death benefits	1,047,519	1,124,882
Contribution refunds	<u>3,097,948</u>	<u>2,931,934</u>
Total benefit payments	<u>45,233,108</u>	<u>41,066,475</u>
Excess of income over expenses	<u>\$49,269,061</u>	<u>\$22,197,235</u>

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

Table 8
Assets as of June 30, 1980 and 1979

	<u>1980</u>	<u>1979</u>
Cash	\$ 1,468,027	\$ 1,489,537
Accrued interest receivable	5,483,287	4,502,823
Investments		
Government bonds	\$108,730,135	\$ 85,046,258
Corporate bonds	131,983,200	125,435,933
Common and preferred stocks	93,568,042	83,989,480
Certificates of deposit	10,625,000	10,450,000
Commercial Paper	52,306,812	43,299,814
(Less) Unamortized premiums and discounts	<u>(3,273,685)</u>	<u>(2,592,089)</u>
Total assets	<u>\$400,890,819</u>	<u>\$351,621,757</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, 1980 and 1979

	<u>1980</u>	<u>1979</u>
State Employees:		
Employer reserves	\$144,085,002	\$125,132,771
Member reserves	<u>66,864,733</u>	<u>59,579,454</u>
Total State Employees reserves	\$210,949,735	\$184,712,225
Teachers:		
Employer reserves	\$ 78,286,448	\$ 66,700,955
Member reserves	<u>91,956,429</u>	<u>82,681,551</u>
Total Teacher reserves	170,242,877	149,382,506
Teachers Survivors:		
Employer reserves	\$ 14,131,256	\$ 12,403,499
Member reserves	<u>5,495,659</u>	<u>5,062,656</u>
Total Teachers Survivors reserves	19,626,915	17,466,156
Unallocated:		
Unclaimed benefit reserve	<u>71,292</u>	<u>60,871</u>
Total assets	<u>\$400,890,819</u>	<u>\$351,621,757</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, 1979 study.

Mortality Rates

We assumed that mortality rates would conform with the 1971 Group Annuity Mortality Table. This is the most commonly used table of pension plan mortality, and we believe it is a reasonable basis for estimating experience under the System. Table 10 gives some life expectancies determined from this table.

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:

<u>Age</u>	<u>Death*</u>	<u>State Employees (Rate %)</u>		<u>Total*</u>
		<u>Disability</u>	<u>Withdrawal</u>	
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 service-connected.

Teachers (Rate %)

<u>Age</u>	<u>Death*</u>	<u>Teachers (Rate %)</u>		<u>Total*</u>
		<u>Disability</u>	<u>Withdrawal</u>	
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.

Retirement Ages

The System provides unreduced benefits as early as age 55 for general employees and age 50 for State Correctional Officers. We have assumed State Employees will retire at age 64, or upon the completion of ten years of service if later. Teacher retirements are assumed to occur when the teacher has attained age 63 and has 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 calculation assumed 3 per cent annual benefit increases as provided by Statute. It should be noted that cost-of-living increases are now "compounded" from year to year. With this valuation we took into account the first adjustment effective January 1, 1981.

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 40 or more 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.

Cost 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 accrued 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, actuarial gains or losses will develop, with corresponding 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	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.

VI. RESULTS OF VALUATION

State Employees

The costs for State Employees as of June 30, 1980, developed as follows:

<u>Item</u>	<u>Amount</u>	<u>% of Payroll</u>
(1) Participating payroll	\$218,021,200	--
(2) Employer normal cost	11,880,100	5.4%
(3) Unfunded actuarial liability	344,521,300	--
(4) Amortization of unfunded actuarial liability -- Interest only	21,027,200	9.6
(5) Total annual cost if paid July 1, 1980 -- Interest only = (2) + (4)	32,907,300	15.1
(6) Total annual cost if paid monthly = (5) plus 1/4 year interest -- Interest only	33,976,800	15.6

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

The revised funding statute calls for the State to contribute 86 per cent of the projected normal cost plus 65 per cent of the interest on the unfunded accrued actuarial liability (as of June 30, 1980) for the 1981-82 fiscal year. Based on this requirement and a projected participating payroll of \$253,000,000, the 1981-82 employer contribution "rate per cent" for State Employees is 10.4 per cent of payroll, developed as follows:

<u>Item</u>	<u>Amount</u>	<u>% of Projected Payroll</u>
(7) Projected 1981-82 participating payroll	\$253,000,000	--
(8) 1981-82 employer normal cost = 5.4491% x (7)	13,786,200	5.4%
(9) Required contribution if paid July 1, 1980 = .86 x (8) + .65 x (4)	25,523,800	10.1
(10) Required contribution if paid monthly = (9) plus 1/4 year interest	26,353,300	10.4

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 6) is 15.6 per cent of payroll which compares to 13.9 per cent for the previous year. The 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, the change in the cost-of-living adjustment from non-compounding to compounding and some data corrections for pensioner benefit amounts.

Teachers

The costs for Teachers as of June 30, 1980 developed as follows:

<u>Item</u>	<u>Amount</u>	<u>% of Payroll</u>
(1) Participating payroll	\$196,305,300	--
(2) Employer normal cost	9,192,600	4.7%
(3) Unfunded actuarial liability	524,531,500	--
(4) Amortization of unfunded actuarial liability -- Interest only	32,013,700	16.3
(5) Total annual cost if paid July 1, 1980 -- Interest only = (2) + (4)	41,206,300	21.0
(6) Total annual cost if paid January, 1981 = (5) plus 1/4 year interest -- Interest only	42,545,500	21.7

Applying the revised funding statute to the Teachers' costs and a projected participating payroll of \$236,587,600, gives a contribution "rate per cent" requirement for fiscal 1981-82 of 13.2 per cent. Half of this (6.6%) is payable by the State and half by the municipalities. The "rate per cent" is developed as follows:

Item	Amount	% of Participating Payroll
(7) Projected 1981-82 participating payroll	\$236,587,600	--
(8) 1981-82 employer normal cost = 4.6828% x (7)	11,078,900	4.7%
(9) Required contribution if paid July 1, 1981 = .86 x (8) + .65 x (4)	30,336,800	12.8
(10) Required contribution if paid January, 1981 = (9) plus ½ year interest	31,322,700	13.2

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 21.7 per cent of payroll which compares to 18.0 per cent for the previous year. The cost increase can be attributed to the same reasons given above for State Employees.

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 provision for pension expense, 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, 1980 is as follows:

	State Employees	Teachers
Active members	\$269,435,300	\$270,608,700
Retired members	205,147,000	261,601,300
Total value of vested benefits	\$474,582,300	\$532,210,000
Assets	210,949,700	170,242,900
Unfunded value of vested benefits	\$263,632,600	\$361,967,100

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 1981-82, as reported earlier, the employer cost is 86 per cent of the normal cost and 65 per cent of the interest payment on the unfunded accrued actuarial liability. The percentage totals in the schedule increase each year:

<u>Fiscal year beginning on July 1</u>	<i>Employer</i> <u>Current service cost</u>	<u>Interest on unfunded liability</u>
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 will comprise the normal cost plus amortization of the remaining unfunded liability on a rising, sum-of-the-digits curve, over 30 years.

* * * * *

MARTIN E. SEGAL COMPANY
INCORPORATED

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

ATLANTA
CHICAGO
CLEVELAND
DALLAS
DENVER
HARTFORD
HOUSTON
LOS ANGELES
NEW ORLEANS
NEW YORK
PHOENIX
SAN FRANCISCO
WASHINGTON, D. C.
TORONTO

January 28, 1981

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, 1980.

The certificate contains the following attached exhibits:

EXHIBIT I - Actuarial Cost for Year Beginning July 1, 1980

- A. State Employees
- B. Teachers

EXHIBIT II - Actuarial Assumptions and Cost 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

Joseph C. Demty

By: Joseph C. Demty, A.S.A.
Actuary

EXHIBIT I
ACTUARIAL COST FOR YEAR BEGINNING JULY 1, 1980

A. STATE EMPLOYEES

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

- a. 16,104 active participants (including 5,023 fully vested) with total annual salaries of \$218,021,200
- b. 4,569 pensioners (including 154 beneficiaries of deceased pensioners and active employees)

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

1. Total normal cost	\$ 23,871,300
2. Projected employee contributions	11,991,200
3. Employer normal cost	11,880,100
4. Actuarial liability - total	555,471,000
Active employees	\$350,324,000
Pensioners (including beneficiaries of deceased pensioners and active employees)	205,147,000
5. Assets	210,949,700
6. Unfunded actuarial liability	344,521,300

Liability for accrued vested benefits: \$474,582,300

Note: Included are 201 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, 1980

B. TEACHERS

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

- a. 11,177 active participants (including 5,816 fully vested) with total annual salaries of \$196,305,300
- b. 2,885 pensioners (including 61 beneficiaries of deceased pensioners and active employees)

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

1. Total normal cost	\$ 21,952,400
2. Projected employee contributions	12,759,800
3. Employer normal cost	9,192,600
4. Actuarial liability - total	694,774,400
Active employees	\$433,173,100
Pensioners (including beneficiaries of deceased pensioners and active employees) ..	261,601,300
5. Assets	170,242,900
6. Unfunded actuarial liability	524,531,500

Liability for accrued vested benefits: \$532,210,000

Note: Included are 39 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 COST 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	.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 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 %)
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

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% compounded annually

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

Cost 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: 5 years
Amount: Regular pension based on service accrued and final average salary at disability (but not less than 17.0%), 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	5 1/2%	6 1/2%	30%
7/1/82 - 6/30/85	6%	7%	30%
7/1/85 and later	6 1/2%	7 1/2%	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 current amount, compounded, to pensioners and beneficiaries following the third anniversary of retirement.

Investments