

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

**REPORT ON THE
ACTUARIAL VALUATION AS OF JUNE 30, 1992**

January 13, 1993

Wyatt



January 13, 1993

State Teachers' Retirement Board
State of Connecticut
165 Capitol Avenue
Hartford, CT 06106

**Re: Actuarial Valuation of the State Teachers' Retirement System as of
June 30, 1992**

Dear Members of the Board:

Under the supervision and direction of the undersigned, The Wyatt Company has prepared an actuarial valuation of the State Teachers' Retirement System as of June 30, 1992, in accordance with generally accepted actuarial principles and practices. To the best of our knowledge, the results set forth in this report are complete and accurate and the contribution requirement for the State of Connecticut developed for the fiscal year ending June 30, 1994 as well as the actuarial present value of accrued and projected benefits shown herein fairly reflect the status of the System at the times indicated.

In preparing this report, we have relied upon the following:

- Member census data as of June 30, 1992 submitted by the Board. This data was not audited by us, but was checked for reasonableness and appears to be sufficient for the purposes of this report.
- Financial data as of June 30, 1992 provided by the State Treasurer's Office and the Board. This data was not audited by us, but appears to be sufficient for the purposes of this report.
- Actuarial assumptions which, in the aggregate, are reasonably related to the past experience of the System and to expected future results. These are the assumptions most recently approved by the Board.
- Actuarial methods and the provisions of the System which are summarized in this report. The results of the June 30, 1992 actuarial valuation reflect the effects of the recent cost of living amendment.

State Teachers' Retirement Board
State of Connecticut
January 13, 1993
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We will be pleased to respond to any questions which may arise in connection with this report.

Respectfully submitted,

THE WYATT COMPANY



Brian F. Dunn
Actuary

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**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

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**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

PURPOSE AND SCOPE

This report has been prepared by The Wyatt Company to:

- Provide the principal results of the actuarial valuation of the State Teachers' Retirement System as of June 30, 1992, based on the actuarial assumptions and methods approved by the Board;
- Compare these results with those from the previous year;
- Provide to the State Teachers' Retirement Board the contribution requirement for the State under Public Act 79-436 (as amended) for the fiscal year ending June 30, 1994; and
- Provide information about the financial status of the System, including a measure of the extent to which benefits have been funded.

The introduction to this document presents a summary of the principal results of the June 30, 1992 actuarial valuation, including the State contribution requirement for the fiscal year ending June 30, 1994 and the funded status of the System as of June 30, 1992. This valuation reflects the recent amendment to the cost of living provisions, which is described on page 3. A comparison of these results with those from the previous year is also included.

Exhibit 1 shows the determination of the unfunded actuarial accrued liability and the normal cost for the year. In Exhibit 2, we develop the State contribution requirement for the fiscal year ending June 30, 1994 in accordance with Public Act 79-436 (as amended).

Exhibit 3 consists of two sets of projections of the State's future contribution requirements.

Exhibit 4 is an historical review of the funded status of the System.

Exhibit 5 consists of a reconciliation of the market value of assets from July 1, 1991 to June 30, 1992. In Exhibit 6 we develop the opening balance of the Excess Earnings Account which will be used to fund cost of living adjustments for teachers who retire on or after September 1, 1992. This opening balance is then used in the development of the actuarial value of assets to be used in determining the State contribution requirement.

In Exhibit 7 and the accompanying charts, we present information regarding the census data for the Members of the System.

The principal provisions of the System are outlined in Exhibit 8, while the actuarial assumptions and cost methods used in this valuation are summarized in Exhibit 9.

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

SUMMARY OF PRINCIPAL ACTUARIAL RESULTS

A. Important Changes

During the 1991 - 1992 session, the State Legislature enacted Public Act 92-205, which changed certain provisions of the System as follows:

Cost of Living Adjustments – Teachers who retired on or before August 31, 1992 will continue to be covered by the cost of living provisions in effect at that time. Teachers who retire on or after September 1, 1992 will no longer be guaranteed a cost of living adjustment of between 3% and 5%. Cost of living adjustments for such teachers will be paid from an Excess Earnings Account and will depend on the rate of investment return for the Teachers' Retirement Fund and on the balance available in the Excess Earnings Account.

Active Teacher Contributions – Effective July 1, 1992, the rate at which active teachers contribute to the Fund was increased from 6% to 7% of annual salary. Of this amount, 1% of annual salary will continue to be used to fund health insurance for retired teachers.

B. Contribution Requirement

The State contribution requirement for the fiscal year ending June 30, 1994 was determined in accordance with Public Act 79-436 (as amended), was based on the actuarial assumptions and methods approved by the Board, and reflects the recent amendment to the teacher contribution rate and the cost of living provisions.

Contribution Requirement for the Fiscal Year Ending June 30, 1994	\$ 145,786,000
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A detailed development of this contribution requirement is included as Exhibit 2.

C. Funded Status of the System

The following table compares the book value and the market value of assets with both the pension benefit obligation (i.e. the actuarial present value of credited projected benefits) and the accumulated benefit obligation (i.e. the actuarial present value of accrued benefits) as of June 30, 1992. The pension benefit obligation (PBO) was based on the Members' service as of the valuation date with salary projected to retirement, while the accumulated benefit obligation (ABO) was based on the Members' service and salary as of the valuation date. Funded ratios were calculated by dividing asset values by the pension benefit obligation.

Book Value Basis	As of June 30, 1992
1. Accumulated Benefit Obligation	\$ 5,448,441,000
2. Pension Benefit Obligation	\$ 6,896,715,000
3. Book Value of Assets	\$ 4,315,424,000
4. Funded Ratio on a Book Value Basis: Item 3 ÷ Item 2	62.6%

Market Value Basis	As of June 30, 1992
1. Accumulated Benefit Obligation	\$ 5,448,441,000
2. Pension Benefit Obligation	\$ 6,896,715,000
3. Book Value of Assets	\$ 5,059,740,000
4. Funded Ratio on a Market Value Basis: Item 3 ÷ Item 2	73.4%

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

COMPARISON OF PRINCIPAL ACTUARIAL RESULTS

What follows is a comparison of the principal actuarial results as of June 30, 1992 (both before and after the cost of living amendment) with those as of June 30, 1991.

	Actuarial Results as of	
	June 30, 1991	June 30, 1992
	(Before COLA Amendment)	(After COLA Amendment)
A. <u>Summary of Data</u>		
1. Number of Members		
a. Active	39,818	38,260
b. Terminated Vested and Inactive	1,907	1,794
c. Retired and Beneficiaries	14,413	16,058
d. Survivors and Dependents	<u>522</u>	<u>530</u>
e. Total	56,660	56,642
2. Characteristics of Active Members		
a. Total Compensation	\$1,792,500,000	\$1,841,880,000
b. Average Annual Compensation	\$45,017	\$48,141
c. Average Age	44.8	44.8
d. Average Service	15.2	15.2

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

COMPARISON OF PRINCIPAL ACTUARIAL RESULTS

	Actuarial Results as of	
	<u>June 30, 1991</u>	<u>June 30, 1992</u>
	(Before COLA Amendment)	(After COLA Amendment)
B. <u>Summary of Costs</u>		
1. Normal Cost		
a. Amount	\$ 127,422,000	\$ 113,857,000
b. As a Percent of Covered Compensation	7.1%	6.2%
2. Actuarial Accrued Liability	\$8,152,657,000	\$8,908,777,000
3. Valuation Assets	\$4,692,007,000	\$5,094,096,000
4. Unfunded Actuarial Accrued Liability	\$3,460,650,000	\$3,814,681,000
5. State Contribution Requirement for Fiscal Year Ending 6/30/93, 6/30/94, Respectively	\$ 299,589,000	\$ 304,021,000
	\$ 41,678,000	\$ 4,847,986,000
	\$ 7,278,246,000	\$ 2,430,260,000
	\$ 145,786,000	\$ 145,786,000

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

COMPARISON OF PRINCIPAL ACTUARIAL RESULTS

	Actuarial Results as of		
	June 30, 1991	June 30, 1992	
C. <u>Assets and Actuarial Present Values</u>			
1. Assets			
a. Book Value	\$4,316,750,000	\$4,561,534,000	\$4,315,424,000
b. Actuarial Value	\$4,692,007,000	\$5,094,096,000	\$4,847,986,000
c. Market Value	\$4,952,089,000	\$5,305,850,000	\$5,059,740,000
2. Actuarial Present Value of Credited Projected Benefits			
a. Member Contributions	\$1,520,314,000	\$1,561,329,000	\$1,561,329,000
b. Retired Members, Beneficiaries, Survivors, Dependents, and Other Inactive Teachers	2,433,987,000	3,468,537,000	3,458,968,000
c. Other Members	<u>3,454,111,000</u>	<u>3,077,345,000</u>	<u>1,876,418,000</u>
d. Total	\$7,408,111,000	\$8,107,211,000	\$6,896,715,000

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

**DETERMINATION OF THE UNFUNDED ACTUARIAL ACCRUED LIABILITY
AND THE NORMAL COST**

The actuarial cost method used to determine the State contribution to the System is the entry age actuarial cost method. Under this method, the normal cost for retirement benefits for each Member is defined as the level percent of the Member's salary needed as an annual contribution from entry age to retirement age to fund the Member's projected benefit. The actuarial accrued liability is the accumulated value of such normal costs for each Member from entry age to the date of the current valuation. (Note: Under this actuarial cost method, the actuarial accrued liability does not represent the liability for benefits accrued as of the valuation date.) The unfunded actuarial accrued liability is the excess of the actuarial accrued liability over the actuarial value of the System's assets.

A. Unfunded Actuarial Accrued Liability (after COLA Amendment)

1. Actuarial Accrued Liability for Retirement Benefits

a. Member Contributions	\$1,561,329,000
b. Active Teachers	2,257,949,000
c. Terminated Vested and Other Inactive Teachers	(4,299,000)
d. Retired Teachers and Beneficiaries	3,450,356,000
e. Survivors and Dependents	<u>12,911,000</u>
f. TOTAL	\$7,278,246,000

2. Actuarial Value of Assets 4,847,986,000

3. Unfunded Actuarial Accrued Liability:
Item 1f. – Item 2 \$2,430,260,000

B. Normal Cost (after COLA Amendment)

1. Normal Cost as of July 1, 1992	\$ 41,678,000
2. Annual Compensation of Active Teachers	1,841,880,000
3. Normal Cost as a Percent of Annual Compensation	2.3%

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

**DEVELOPMENT OF THE STATE CONTRIBUTION REQUIREMENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1994**

The State contribution requirement for the fiscal year ending June 30, 1994 was determined in accordance with Public Act 79-436 (as amended) and was based on the expected unfunded actuarial accrued liability as of June 30, 1993 and an estimate of the July 1, 1993 normal cost. This estimate was based on the July 1, 1992 normal cost and an estimate of future salary increases.

To develop the expected unfunded actuarial accrued liability as of June 30, 1993, the actual unfunded actuarial accrued liability as of June 30, 1992 was added to the normal cost as of July 1, 1992 and this sum was adjusted for one year's interest at the valuation rate of 8.5% per annum. This result was then reduced by the State contribution adjusted with interest. The expected unfunded actuarial accrued liability was then amortized in accordance with Public Act 79-436 (as amended) which requires that changes after 1980 be funded separately by contributions of normal cost plus 30-year amortization of the applicable unfunded actuarial accrued liability.

As shown on the following page, the expected unfunded actuarial accrued liability and the contribution for the amendments to the System resulting from Public Acts 82-91, 87-381, and 92-205 were developed separately.

The State contribution requirement for the fiscal year ending June 30, 1994 is \$145,786,000.

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

DEVELOPMENT OF THE STATE CONTRIBUTION REQUIREMENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1994

	Provisions In Effect June 30, 1991	Public			Total
		Act 82-91	Act 87-381	Act 92-205	
1. Unfunded Actuarial Accrued Liability as of 6/30/92	\$3,781,308,000	\$31,683,000	\$1,690,000	(\$1,384,421,000)	\$2,430,260,000
2. Normal Cost as of 7/1/92	41,678,000	0	0	0	41,678,000
3. Interest at 8.5% on (Item 1 + Item 2)	324,954,000	2,693,000	144,000	(117,676,000)	210,115,000
4. State Contribution	(109,477,000)	(2,030,000)	(93,000)	0	(111,600,000)
5. Interest to End of Year on Item 4	(5,757,000)	(107,000)	(5,000)	0	(5,869,000)
6. Expected Unfunded Actuarial					
Accrued Liability as of 6/30/93	4,032,706,000	32,239,000	1,736,000	(1,502,097,000)	2,564,584,000
7. Level Percent Amortization					
Payment (39/20/25/30 Years)	167,682,000	2,077,000	95,000	(73,018,000)	96,836,000
8. Estimated Normal Cost	44,595,000	0	0	0	44,595,000
9. Total: Item 7 + Item 8	212,277,000	2,077,000	95,000	(73,018,000)	141,431,000
10. State Contribution Requirement: Item 9 Adjusted with Interest for Payment Quarterly in Advance	\$218,814,000	\$2,141,000	\$98,000	(\$75,267,000)	\$145,786,000

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

**PROJECTED CONTRIBUTIONS BASED ON THE JUNE 30, 1992
ACTUARIAL RESULTS**

The following tables contain projections of the State contribution requirements under two alternative assumptions regarding the future growth of teachers' salaries.

For the purpose of these illustrations, we have developed 40-year projections based on aggregate salary increases of 6% and 8% per year, assuming the number of active teachers will remain at 38,260. Results shown for 1980 - 1992 (which correspond to contributions for fiscal years 1982 - 1994) are based on actual results for of the System. Results shown for the projection period from 1993 to 2033 (which correspond to contributions for fiscal years from 1995 to 2035) are based on estimates of future results.

Each line of the tables contains the normal cost and unfunded actuarial accrued liability as of a particular valuation date followed by contribution information related to the appropriate fiscal year. The full contribution amount and the required contribution amount under PA 79-436 (as amended) are included both as a dollar figure and as a percentage of the historical or estimated future teachers' payroll, as applicable.

For example, the June 30, 1989 valuation generated a normal cost of \$127,787,000 and an unfunded actuarial accrued liability of \$4,343,412,000. Together, those results were used in calculating both the full contribution of \$337,934,000 and the required contribution of \$304,331,000 for the fiscal year ending June 30, 1991. The above contribution requirements represent 20.3% and 18.3%, respectively, of the teachers' payroll of \$1,663,765,000 for the fiscal year ending June 30, 1990.

The following differences exist between the required contributions as recommended by the Board and as shown on the tables and the actual contribution amounts appropriated to the System:

<u>Fiscal Year Ending June 30,</u>	<u>Required Contribution</u>	<u>Actual Contribution</u>
1989	\$302,917,000	\$282,917,000
1990	\$348,639,000	\$321,639,000
1991	\$304,331,000	\$156,638,000
1992	\$308,724,000	\$133,057,000
1993	\$299,589,000	*

For consistency with other numbers shown, the tables contain the required amounts but the projections take the actual amounts into consideration.

* At the time this report was written, the State had contributed \$83,700,000 for the fiscal year ending June 30, 1993. The projections are based on the assumption that an additional contribution of \$27,900,000 would be made.

Table 2
STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1992
(in thousands of dollars)

Teachers' Payroll is Assumed to Increase 8% per Annum Starting July 1, 1992

Actuarial Results as of June 30,		Contribution Amounts for the Fiscal Year Ending June 30,								
Normal Cost	Unfunded Actuarial Accrued Liability	Full Contribution	Percent of Payroll	Funding Percent	Required Contribution	Percent of Payroll	Teachers' Payroll for Fiscal Year			
1980	\$61,032	\$1,818,569	1982	\$216,933	29.6%	35%	\$75,927	10.3%	1980-81	\$734,100
1981	64,694	2,055,025	1983	238,861	31.0%	40%	96,798	12.6%	1981-82	769,500
1982	69,601	2,284,380	1984	273,348	33.1%	45%	120,163	14.5%	1982-83	825,888
1983	73,777	2,410,980	1985	289,579	32.7%	50%	145,959	16.5%	1983-84	886,409
1984	107,293	3,261,067	1986	269,102	27.6%	65%	175,312	18.0%	1984-85	975,248
1985	117,505	3,500,185	1987	290,771	27.3%	70%	203,987	19.2%	1985-86	1,065,077
1986	132,310	3,818,585	1988	321,551	26.9%	75%	241,563	20.2%	1986-87	1,193,463
1987	151,005	4,611,656	1989	378,216	27.6%	80%	302,917	22.1%	1987-88	1,369,950
1988	173,335	4,788,106	1990	409,844	26.6%	85%	348,639	22.6%	1988-89	1,540,789
1989	127,787	4,343,412	1991	337,934	20.3%	90%	304,331	18.3%	1989-90	1,663,765
1990	126,755	3,960,871	1992	324,866	18.1%	95%	308,724	17.2%	1990-91	1,792,500
1991	127,422	3,460,650	1993	299,589	16.3%	100%	299,589	16.3%	1991-92	1,841,880
1992	41,678	2,430,260	1994	145,786	7.3%	100%	145,786	7.3%	1992-93	1,989,230
1993	44,595	2,564,584	1995	158,602	7.4%	100%	158,602	7.4%	1993-94	2,148,368
1994	48,163	2,761,379	1996	172,490	7.4%	100%	172,490	7.4%	1994-95	2,320,237
1995	52,016	2,970,315	1997	187,540	7.5%	100%	187,540	7.5%	1995-96	2,505,856
1996	56,177	3,191,846	1998	203,848	7.5%	100%	203,848	7.5%	1996-97	2,706,324
1997	60,671	3,426,393	1999	221,515	7.6%	100%	221,515	7.6%	1997-98	2,922,830
2002	89,145	4,806,117	2004	334,403	7.8%	100%	334,403	7.8%	2002-03	4,294,596
2007	130,983	6,538,948	2009	502,123	8.0%	100%	502,123	8.0%	2007-08	6,310,170
2012	192,457	8,556,870	2014	744,330	8.0%	100%	744,330	8.0%	2012-13	9,271,710
2017	282,783	10,627,764	2019	1,109,163	8.1%	100%	1,109,163	8.1%	2017-18	13,623,184
2022	415,501	12,095,135	2024	2,022,973	10.1%	100%	2,022,973	10.1%	2022-23	20,016,927
2027	610,507	9,603,586	2029	2,931,311	10.0%	100%	2,931,311	10.0%	2027-28	29,411,433
2032	897,035	0	2034	998,635	2.3%	100%	998,635	2.3%	2032-33	43,215,044

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**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

Exhibit 4

THE FUNDED STATUS OF THE SYSTEM

As noted in the Summary of Principal Actuarial Results, we have compared the market value of assets with the actuarial present value of credited projected benefits (Pension Benefit Obligation) to obtain one measure of how the System is meeting its obligation to fund benefits payable to its Members.

The actuarial present value of credited projected benefits was based on Members' service as of the valuation date and upon salary projected to retirement. In attempting to compare the current results with those of prior years, it is crucial to keep in mind that the actuarial basis for the calculations has been changed from time to time. Therefore, the actuarial present value of benefits as of June 30, 1989 (and as of June 30, 1991) is not comparable to results from prior years. The increase in the funded ratio to 58.3% and the decrease of the unfunded ratio to 191.7% are primarily due to changes in the measurement scale (i.e., the actuarial assumptions).

As of June 30	Market Value of Assets	Pension		Funded Ratio	Unfunded		Annual Compensation	Unfunded Ratio
		Benefit Obligation	Benefit Obligation		Pension Benefit Obligation	Compensation		
1980	\$ 1,049,306,000	\$ 2,603,702,000	\$	40.3%	\$ 1,554,396,000	\$	692,547,000	224.4%
1982	1,154,963,000	3,244,804,000		35.6%	2,089,841,000		769,500,000	271.6%
1984	1,696,074,000	4,398,687,000		38.6%	2,702,613,000		886,409,000	304.9%
1985	2,157,914,000	4,882,540,000		44.2%	2,724,626,000		975,248,000	279.4%
1986	2,728,837,000	5,305,841,000		51.4%	2,577,004,000		1,065,077,000	242.0%
1987	3,188,223,000	6,293,712,000		50.7%	3,105,489,000		1,193,463,000	260.2%
1988	3,422,467,000	6,856,672,000		49.9%	3,434,205,000		1,369,950,000	250.7%
1989	4,136,564,000	7,090,175,000		58.3%	2,953,611,000		1,540,789,000	191.7%
1990	4,789,238,000	7,425,158,000		64.5%	2,635,920,000		1,663,765,000	158.4%
1991	4,952,089,000	7,408,412,000		66.8%	2,456,323,000		1,792,500,000	137.0%
1992	5,059,740,000	6,896,715,000		73.4%	1,836,975,000		1,841,880,000	99.7%

Analysis of the funded ratio over time indicates how the System is meeting its obligation to fund benefits. Generally, the greater this ratio, the stronger and more well-funded the System.

We have also compared the unfunded pension benefit obligation with annual compensation to remove the effects of inflation and to aid in the analysis of the System's progress in accumulating sufficient assets to pay benefits when due. Generally, the smaller the unfunded percentage, the stronger the System.

The market value of assets as of June 30, 1992 reflects the adjustment of \$246,110,000 for the Excess Earnings Account.

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

RECONCILIATION OF THE MARKET VALUE OF ASSETS

A. Reconciliation

1.	Market Value of Assets as of July 1, 1991	\$ 4,952,089,000
2.	Contributions (from State and Members),	238,770,000
3.	Benefit Payments:	
	a. Pension Payments	(274,792,000)
	b. Refund of Member Contributions	(8,339,000)
	c. Survivorship Benefits	(3,285,000)
4.	Net Investment Income	<u>401,407,000</u>
5.	Market Value of Assets as of June 30, 1992 (prior to adjustment for Excess Earnings Account)	\$ 5,305,850,000

B. Net Rate of Return on Market Value of Assets 8.1%
(prior to adjustment for Excess Earnings Account)

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

DEVELOPMENT OF THE ACTUARIAL VALUATION ASSETS

A. Excess Earnings Account

Prior to developing the actuarial value of assets as of June 30, 1992, we determined the opening balance of the Excess Earnings Account which was established by PA 92-205 (the COLA amendment). The opening balance was based on the performance of the Teachers' Retirement Fund during the 1991 calendar year. Beginning and end of year market values as well as the rate of investment return for 1991 were supplied by the Treasurer's Office.

1. Market Value of Assets as of December 31, 1990	\$ 4,606,967,000
2. Market Value of Assets as of December 31, 1991	\$ 5,332,283,000
3. Rate of Investment Return during 1991	16.87%
4. Investment Income during 1991:	\$ 773,160,000
5. Net Cash Flow: Item 2 – Item 1 – Item 4	\$ (47,844,000)
6. Average Fund Value: Item 1 + ½ Item 5	\$ 4,583,045,000
7. Rate of Investment Return during 1991 in Excess of 11.5%	5.37%
8. Opening Balance of Excess Earnings Account: Item 6 x Item 7	\$ 246,110,000

B. Actuarial Value of Assets

In order to reduce potential volatility in the market value of the System's assets, a smoothing technique is used to develop an actuarial value of assets. This value is then used to determine the unfunded actuarial accrued liability.

To develop the actuarial value of assets as of June 30, 1992, the actuarial value of assets as of July 1, 1991 was increased by contributions to the System and reduced by benefit payments made to former Members and their Beneficiaries. These amounts were then adjusted with interest to the end of the year, using the expected rate of return on assets. The resulting figure represents the expected actuarial value of assets, provided the assumed rate of return will be realized.

The expected actuarial value of assets at year end was then compared with the market value of assets as of June 30, 1992 and 20% of the difference was recognized. The resulting value would have been further adjusted if it had been less than 80% or greater than 120% of the market value of assets. Finally, the actuarial value of assets in Item 12 is reduced by the value of the Excess Earnings Account as of June 30, 1992.

1. Actuarial Value of Assets as of July 1, 1991	\$4,692,007,000
2. Contributions	238,770,000
3. Benefit Payments	286,416,000
4. Net Transactions: Item 2 - Item 3	(47,646,000)
5. Expected Rate of Return	8.5%
6. Expected Investment Return: Item 5 x (Item 1 + ½ Item 4)	396,796,000
7. Expected Actuarial Value of Assets as of June 30, 1992: Item 1 + Item 4 + Item 6	5,041,157,000
8. Market Value of Assets as of June 30, 1992	5,305,850,000
9. Adjustment: 20% of the Difference between Item 8 and Item 7	52,939,000
10. Preliminary Actuarial Value of Assets as of June 30, 1992: Item 7 + Item 9	5,094,096,000
11. Limiting Values:	
a. 80% of Item 8	4,244,680,000
b. 120% of Item 8	6,367,020,000
12. Actuarial Value of Assets as of June 30, 1992: Item 10, but not less than Item 11.a. or greater than Item 11.b.	5,094,096,000
13. Value of Excess Earnings Account as of June 30, 1992	246,110,000
14. Adjusted Actuarial Value of Assets as of June 30, 1992: Item 12 – Item 13	\$ 4,847,986,000

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

CENSUS DATA FOR MEMBERS IN THE SYSTEM

We were provided with census data on each active teacher who was in the System as of June 30, 1992. The data included name, sex, date of birth, service, salary, and the Member's contributions. Pertinent data was also provided for each retiree, beneficiary, survivor, and dependent as of June 30, 1992, including name, sex, date of birth, date of retirement, amount and form of monthly benefit, and beneficiary information, where applicable. In addition, we received data on former teachers who were no longer active in the System.

The table below gives a comparison of certain characteristics of Members in the System between this year and last year.

	<u>June 30, 1991</u>	<u>June 30, 1992</u>
1. Active Teachers		
a. Number	39,818	38,260
b. Average Age	44.8	44.8
c. Average Service	15.2	15.2
d. Average Annual Compensation	\$ 45,017	\$ 48,141
2. Terminated Vested Teachers		
a. Number	584	535
b. Average Monthly Deferred Benefit	\$ 460	\$ 456
3. Survivors and Dependents		
a. Number	522	530
b. Average Monthly Benefit	\$ 261	\$ 262
4. Retired Teachers and Beneficiaries		
a. Number	14,413	16,058
b. Average Monthly Benefit	\$ 1,524	\$ 1,700

Chart 1

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1992
(MALES ONLY)

AGE NRST BIRTHDAY AT VAL DATE	NUMBER OF ACTIVE MEMBERS COMPLETED YEARS OF SERVICE													Total	
	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39		
20 - 24	3	11	6	0	0	0	0	0	0	0	0	0	0	0	20
25 - 29	11	32	51	49	41	59	0	0	0	0	0	0	0	0	243
30 - 34	14	27	29	30	66	322	86	0	0	0	0	0	0	0	574
35 - 39	8	26	40	58	54	280	445	185	0	0	0	0	0	0	1096
40 - 44	5	31	42	46	34	265	354	993	627	0	0	0	0	0	2397
45 - 49	4	11	32	29	27	165	187	441	1825	613	0	0	0	0	3334
50 - 54	6	8	10	7	15	76	69	98	432	1122	340	0	0	0	2183
55 - 59	0	7	6	6	8	35	29	55	141	307	621	52	0	0	1267
60 - 61	0	1	0	0	3	9	8	16	29	41	71	44	0	0	222
62 - 64	1	1	2	1	1	10	8	10	25	30	38	46	7	0	180
65 - 69	0	0	0	1	0	2	2	2	12	16	5	5	13	0	58
70 & up	0	0	0	0	0	0	2	2	5	1	2	1	2	0	15
Total	52	155	218	227	249	1223	1190	1802	3096	2130	1077	148	22	0	11589

Chart 2

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1992
(FEMALES ONLY)

AGE NRST BIRTHDAY AT VAL DATE	NUMBER OF ACTIVE MEMBERS COMPLETED YEARS OF SERVICE													Total								
	0	1	2	3	4	5	9	10	14	15	19	20	24		25	29	30	34	35	39	Over 39	
20 - 24	28	107	61	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	198
25 - 29	49	227	318	293	278	450	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1615
30 - 34	33	113	147	160	225	1289	236	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2203
35 - 39	34	117	155	172	195	889	1285	463	0	0	0	0	0	0	0	0	0	0	0	0	0	3310
40 - 44	60	173	215	254	325	1191	930	1966	1160	0	0	0	0	0	0	0	0	0	0	0	0	6274
45 - 49	22	95	138	167	238	1207	872	767	2024	690	0	0	0	0	0	0	0	0	0	0	0	6220
50 - 54	14	35	42	57	80	524	604	610	660	745	250	0	0	0	0	0	0	0	0	0	0	3621
55 - 59	5	11	11	11	32	170	246	426	547	344	292	53	0	0	0	0	0	0	0	0	0	2148
60 - 61	2	0	0	3	5	36	53	100	134	62	35	23	0	0	0	0	0	0	0	0	0	453
62 - 64	0	1	1	2	2	23	29	74	111	82	43	16	7	0	0	0	0	0	0	0	0	391
65 - 69	0	0	0	0	0	8	21	37	51	40	20	13	15	0	0	0	0	0	0	0	0	205
70 & up	0	0	0	0	0	0	3	5	6	8	5	3	3	0	0	0	0	0	0	0	0	33
Total	247	879	1088	1121	1380	5787	4279	4448	4693	1971	645	108	25	0	0	0	0	0	0	0	0	26671

Chart 3

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1992
(ALL MEMBERS)

AGE NRST BIRTHDAY AT VAL DATE	NUMBER OF ACTIVE MEMBERS COMPLETED YEARS OF SERVICE													Total								
	0	1	2	3	4	5	9	10	14	15	19	20	24		25	29	30	34	35	39	Over 39	
20 - 24	31	118	67	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	218
25 - 29	60	259	369	342	319	509	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1858
30 - 34	47	140	176	190	291	1611	322	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2777
35 - 39	42	143	195	230	249	1169	1730	648	0	0	0	0	0	0	0	0	0	0	0	0	0	4406
40 - 44	65	204	257	300	359	1456	1284	2959	1787	0	0	0	0	0	0	0	0	0	0	0	0	8671
45 - 49	26	106	170	196	265	1372	1059	1208	3849	1303	0	0	0	0	0	0	0	0	0	0	0	9554
50 - 54	20	43	52	64	95	600	673	708	1092	1867	590	0	0	0	0	0	0	0	0	0	0	5804
55 - 59	5	18	17	17	40	205	275	481	688	651	913	105	0	0	0	0	0	0	0	0	0	3415
60 - 61	2	1	0	3	8	45	61	116	163	103	106	67	0	0	0	0	0	0	0	0	0	675
62 - 64	1	2	3	3	3	33	37	84	136	112	81	62	14	0	0	0	0	0	0	0	0	571
65 - 69	0	0	0	1	0	10	23	39	63	56	25	18	28	0	0	0	0	0	0	0	0	263
70 & up	0	0	0	0	0	0	5	7	11	9	7	4	5	0	0	0	0	0	0	0	0	48
Total	299	1034	1306	1348	1629	7010	5469	6250	7789	4101	1722	256	47	0	0	0	0	0	0	0	0	38260

Chart 4

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1992
(MALES ONLY)

AGE NRST BIRTHDAY AT VAL DATE	AVERAGE ANNUAL SALARY COMPLETED YEARS OF SERVICE													Total								
	0	1	2	3	4	5	9	10	14	15	19	20	24		25	29	30	34	35	39	Over 39	
20 - 24	25787	26319	29255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27120
25 - 29	25905	27383	30165	31290	33163	35065	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31635
30 - 34	27695	29531	32868	34512	36415	37967	42398	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37367
35 - 39	34630	31693	37486	39062	40067	41146	47184	51008	0	0	0	0	0	0	0	0	0	0	0	0	0	44693
40 - 44	35698	41781	42029	49372	46124	47011	49564	54086	54621	0	0	0	0	0	0	0	0	0	0	0	0	52164
45 - 49	54425	57636	46627	51040	50396	50851	54454	55960	56002	56930	0	0	0	0	0	0	0	0	0	0	0	55650
50 - 54	59348	46502	56480	48089	56699	56296	55909	55437	56656	57779	59543	0	0	0	0	0	0	0	0	0	0	57534
55 - 59	0	36392	76182	47262	55859	48892	60514	58051	57355	57009	59892	61730	0	0	0	0	0	0	0	0	0	58479
60 - 61	0	35563	0	0	42047	47516	64585	52506	61867	55232	57203	62548	0	0	0	0	0	0	0	0	0	57740
62 - 64	20000	66950	41397	57409	44292	46872	55497	59448	57500	61608	57235	59680	72656	0	0	0	0	0	0	0	0	58295
65 - 69	0	0	0	43562	0	54965	49800	57440	56542	60000	55890	64096	65287	0	0	0	0	0	0	0	0	59571
70 & up	0	0	0	0	0	0	47221	54356	53904	51846	58880	50200	55962	0	0	0	0	0	0	0	0	53627
Total	34603	35133	39122	40998	41459	43897	49696	54443	55941	57443	59490	61338	66784	0	0	0	0	0	0	0	0	53197

Wigatt

Chart 5

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1992
(FEMALES ONLY)

AGE NRST BIRTHDAY AT VAL DATE	AVERAGE ANNUAL SALARY COMPLETED YEARS OF SERVICE													Total									
	0	1	2	3	4	5	9	10	14	15	19	20	24		25	29	30	34	35	39	Over 39		
20 - 24	27648	26146	29065	30050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27297	
25 - 29	27850	28777	30458	31526	33047	34949	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32034	
30 - 34	32379	30487	33269	34374	35671	37709	41947	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36966	
35 - 39	30751	30462	34224	35905	37530	40687	45013	49494	0	0	0	0	0	0	0	0	0	0	0	0	0	42398	
40 - 44	32552	32396	35522	35563	38269	42001	46866	51557	52981	0	0	0	0	0	0	0	0	0	0	0	0	46715	
45 - 49	29737	32942	37302	38849	39085	41926	47762	52019	53329	54297	0	0	0	0	0	0	0	0	0	0	0	48598	
50 - 54	39839	34651	38342	39883	41249	43418	48174	52332	53845	54179	55583	0	0	0	0	0	0	0	0	0	0	50406	
55 - 59	41959	47955	44590	38532	41308	43237	48902	51953	53684	53846	55607	56415	0	0	0	0	0	0	0	0	0	51956	
60 - 61	55576	0	0	62889	38216	44628	47387	52427	53652	52847	52019	56766	0	0	0	0	0	0	0	0	0	51753	
62 - 64	0	20000	32266	35540	39698	45844	48692	53631	54368	53638	55077	53078	53506	52847	54061	58206	54251	63096	53714	45944	57477	52847	
65 - 69	0	0	0	0	0	48004	51436	51308	54826	54793	57255	54911	58206	54061	53714	45944	57477	52847	54061	53714	45944	52847	
70 & up	0	0	0	0	0	0	44958	55488	55333	50820	53929	54251	63096	53714	45944	57477	52847	54061	53714	45944	52847	52847	
Total	31331	30527	33614	35192	37075	40484	46563	51622	53410	54097	55406	55754	57477	52847	54061	53714	45944	52847	54061	53714	45944	52847	52847

Chart 6

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1992
(ALL MEMBERS)

AGE NRST BIRTHDAY AT VAL DATE	AVERAGE ANNUAL SALARY COMPLETED YEARS OF SERVICE													Total								
	0	1	2	3	4	5	9	10	14	15	19	20	24		25	29	30	34	35	39	Over 39	
20 - 24	27468	26162	29082	30050	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27281
25 - 29	27493	28604	30418	31493	33062	35013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31981
30 - 34	30984	30303	33203	34396	35840	37760	42067	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37049
35 - 39	31490	30686	34893	36701	38080	40797	45571	49926	0	0	0	0	0	0	0	0	0	0	0	0	0	42969
40 - 44	32794	33822	36586	37681	39013	42913	47610	52406	53556	0	0	0	0	0	0	0	0	0	0	0	0	48222
45 - 49	33535	35505	39057	40653	40238	43000	48944	53458	54596	55536	0	0	0	0	0	0	0	0	0	0	0	51059
50 - 54	45691	36856	41830	40780	43688	45049	48967	52761	54957	56343	57865	0	0	0	0	0	0	0	0	0	0	53087
55 - 59	41959	43458	55740	41613	44218	44202	50127	52650	54437	55338	58521	59047	0	0	0	0	0	0	0	0	0	54376
60 - 61	55576	35563	0	62889	39653	45206	49643	52438	55114	53796	55491	60563	0	0	0	0	0	0	0	0	0	53722
62 - 64	20000	43475	38353	42829	41229	46155	50164	54323	54944	55773	56089	57976	63081	0	0	0	0	0	0	0	0	54564
65 - 69	0	0	0	43562	0	49396	51293	51622	55153	56281	56982	57462	61493	55276	0	0	0	0	0	0	0	55276
70 & up	0	0	0	0	0	0	45863	55164	54683	50934	55344	53238	60243	53687	0	0	0	0	0	0	0	53687
Total	31900	31218	34533	36170	37745	41079	47244	52436	54416	55835	57960	58982	61833	48141	0	0	0	0	0	0	0	48141

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM**

OUTLINE OF THE PRINCIPAL PROVISIONS OF THE SYSTEM

Outlined below are the principal provisions of the System which were reflected in the results shown in this report.

1. Covered Employees

Any teacher, principal, superintendent or supervisor engaged in service of public schools, plus professional employees at State schools of higher education if they choose to be covered.

2. Salary

Amount paid to a teacher as specified in a contract of employment excluding amounts paid for extra duty assignments, coaching, unused sick time, unused vacation or terminal pay.

3. Average Annual Salary

Average of annual salary received during three years of highest salary.

4. Credited Service

One month for each month of service as a teacher in Connecticut public schools, maximum 10 months for each school year. Ten months of credited service constitutes one year of Credited Service. Certain other types of teaching service, State employment, or war-time military service may be purchased at retirement, if the Member pays one-half of the cost.

5. Normal Retirement

Eligibility: Age 60 and 20 years of Credited Service in Connecticut or 35 years of Credited Service including at least 25 years of service in Connecticut.

Benefit: 2% times years of Credited Service times Average Annual Salary (maximum percent is 75%)

plus

any additional amounts derived from the accumulation of 6th percent contributions made prior to July 1, 1989 and voluntary contributions by the teacher.

Minimum Benefit: Effective January 1, 1988, Public Act 87-381 provides a minimum monthly retirement benefit of \$800 to teachers who retire under the Normal Retirement provisions and who complete at least 25 years of full time Connecticut service at retirement.

6. Early Retirement

Eligibility: At any age after the completion of 25 years of Credited Service including 20 years of Connecticut service or at or after age 55 and the completion of 20 years of Credited Service including 15 years of Connecticut service, with the last 5 years in Connecticut.

Benefit: Reduced normal retirement benefit. The early retirement factors currently in effect are 6% per year for the first five years by which early retirement precedes the minimum normal retirement age and 4% per year for the next five years by which early retirement precedes the minimum normal retirement age.

7. Proratable Retirement

Eligibility: Age 60 and 10 years of Credited Service with the last 5 years in Connecticut.

Benefit: 2% less .1% for each year less than 20 years times years of Credited Service in Connecticut plus 1% times years of additional Credited Service times Average Annual Salary.

8. Disability Retirement

Eligibility: Disability prior to age 60 and after 5 years of Credited Service in Connecticut if not incurred in the performance of duty and without regard to service if incurred in the performance of duty.

Benefit: Lesser of:

- 3% times Credited Service to date of disability times Average Annual Salary;
- 1-2/3% times Credited Service projected to age 60 times Average Annual Salary;
- 50% times Average Annual Salary.

Not less than 15% times Average Annual Salary.

9. Termination of Employment

With less than 5 years of Credited Service: Return of 5% contributions with interest.

With 5 or more years of Credited Service: Return of 5% contributions with interest and 1% contributions made prior to July 1, 1989 without interest.

With 10 or more years of Credited Service: 100% vested. Member may elect return of all contributions plus interest on 5% contributions in lieu of vested benefit.

10. Pre-Retirement Death Benefits

A lump sum plus one of the following: survivor's benefit, return of all contributions with interest, surviving spouse's benefit, or automatic surviving spouse's benefit.

- Lump Sum: \$1,000 for the first 5 years of Connecticut service plus \$200 per year thereafter. Maximum benefit: \$2,000.
- Survivor's Benefit: \$300 per month to a surviving spouse or dependent former spouse (receiving child support), or to a dependent parent over age 65 if there is no surviving spouse or dependent child, or to a legal guardian if there is no surviving spouse, dependent former spouse, or dependent parent. \$200 per month to a single dependent child under age 18 or over 18 if disabled. \$300 per month divided equally among two or more such children in a family.
- Accumulated contributions with interest plus dependent children's benefits as described in the "Survivor's Benefit" paragraph.
- Surviving Spouse's Benefit: the 50% co-participant option plus dependent children's benefits as described in the "Survivor's Benefit" paragraph.
- Automatic Surviving Spouse's Benefit: Prefiled co-participant option with the percent continued chosen from 33-1/3%, 50%, 66-2/3%, 75%, or 100%.

11. Form of Annuity

Normal: Partial Refund Option - 75% of total benefit is paid as a life annuity. If 25% of the benefits paid prior to death do not exceed the Member's 6% contributions plus interest frozen at the date of benefit commencement, the difference is paid to his beneficiary.

Optional Forms: 5-, 10-, 20-, or 25-year certain and life. 33-1/3%, 50%, 66-2/3%, 75%, or 100% co-participant annuity (if co-participant dies first, benefit reverts to unreduced amount).

12. Cost-of-Living Allowance

For teachers who retired prior to September 1, 1992, pension benefit adjustments are made in accordance with increases in the Consumer Price Index, with a minimum of 3% and a maximum of 5% per annum. Benefit adjustments for teachers who retire on or after September 1, 1992, will be provided through the Excess Earnings Account. The amount of such adjustments will depend upon the adequacy of the Excess Earnings Account as well as the investment returns of the Teachers' Retirement Fund.

13. Teachers' Required Contribution

Effective July 1, 1992, each teacher is required to contribute 7% of annual salary. Of this amount, 1% of annual salary will be used for health insurance for retired teachers, except for the first \$500,000 of such total.

14. State Contribution

The State's contribution requirement to fund the balance of the liability for benefits with annual contributions (currently paid in installments at the beginning of each quarter) is determined in accordance with Section 10-183(z) (which reflects Public Act 79-436 as amended).

**STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM
SUMMARY OF ACTUARIAL ASSUMPTIONS AND
ACTUARIAL COST METHODS**

The following is a summary of the actuarial assumptions and the actuarial cost methods used in this valuation of the State Teachers' Retirement System.

A. Actuarial Assumption

- 1. Investment Return: 8.5% per annum, compounded annually.
- 2. Mortality: The Unisex Pension Table for 1984, set back five years in age for females.

3. Termination of Employment:

<u>Years of Service</u>	<u>Rate</u>
1 - 5	9%
6 - 10	5%
11 - 20	2%
21 and above	1%

4. Salary Increases:

<u>Years of Service</u>	<u>Rate</u>
0 - 15	8.0%
16 and above	5.5%

5. Cost of Living Increases:

Annual increases in pensions of 4% after retirement for teachers who retired prior to September 1, 1992. Increases for teachers who retire on or after September 1, 1992 will be provided through the Excess Earnings Account.

B. Actuarial Cost Methods;
Asset Valuation Method

1. Actuarial Cost Methods:

The entry age actuarial cost method was used to determine liabilities related to the State's contribution requirement.

The unit credit actuarial cost method was used to determine the actuarial present value of accrued benefits, which is used to measure the funded status of the System.

2. Valuation of Assets:

The valuation assets are updated with actual contributions and benefit payments, and with interest at a rate equal to the valuation rate of 8.5%. This preliminary value is compared with the market value of assets and 20% of the difference is recognized. The actuarial value of assets is further adjusted if necessary to lie between 80% and 120% of the market value of assets. Finally, the actuarial value of assets is reduced by the value of Excess Earnings Account as of the valuation date.