THE WYATT COMPANY
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STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

REPORT ON THE
ACTUARIAL VALUATION AS OF JUNE 30, 1990

January 9, 1991

January 9, 1991

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, 1990

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, 1990 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, 1992 as well as the actuarial present value of accrued 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, 1990 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, 1990 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 assumptions were approved by the Board last year.

- Actuarial methods and the provisions of the System which are summarized in this report.

State Teachers' Retirement Board
January 9, 1991
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We would be pleased to answer questions concerning this report, or to provide additional information or analysis that may be required.

Respectfully submitted,

THE WYATT COMPANY

Brian F. Dunn
Associate, Society of Actuaries

Robert A. Rosati
Fellow, Society of Actuaries

BFD/RAR/db

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:

- Present the principal results of the actuarial valuation of the State Teachers' Retirement System as of June 30, 1990, based on the actuarial assumptions and methods approved by the Board;

- Compare these results with those from the previous valuation;

- 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, 1992; 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, 1990 actuarial valuation, including the State contribution requirement for the fiscal year ending June 30, 1992 and the funded status of the System as of June 30, 1990. A comparison of these results with those from the previous valuation 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, 1992 in accordance with Public Act 79-436 (as amended).

Exhibit 3 consists of three 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, 1989 to June 30, 1990. In Exhibit 6 we develop the actuarial value of assets to be used in determining the State contribution requirement.

In Exhibit 7 and the accompanying graphs and 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. Exhibits 10 and 11 contain descriptions of the actuarial cost methods used in this valuation.

THE *Wyatt* COMPANY

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

SUMMARY OF PRINCIPAL VALUATION RESULTS

A. Contribution Requirement

The State contribution requirement for the fiscal year ending June 30, 1992 was determined in accordance with Public Act 79-436 (as amended) and was based on the actuarial assumptions and methods adopted by the Board.

Contribution Requirement for the
Fiscal Year Ending June 30, 1992 $ 308,724,000

A detailed development of this contribution requirement is included as Exhibit 2.

B. Funded Status of the System

As in prior years, we show the funded status of the System as of June 30, 1990 by comparing the market value of assets with the actuarial present value of credited projected benefits as of that date. This actuarial present value of credited projected benefits was based on Members' service as of the valuation date with salary projected to retirement using the actuarial assumptions.

This year we also show a comparison of the book value of assets with the actuarial present value of credited projected benefits as of June 30, 1990.

1. Actuarial Present Values for:

    a. Retired Teachers, Beneficiaries,
        Survivors, Dependents, and Other
        Inactive Teachers $2,359,947,000

    b. Active Teachers   3,668,501,000

    c. Member Contributions   1,396,710,000

    d. Total $7,425,158,000

2. Market Value of Assets $4,789,238,000

3. Funded Ratio on a Market Value Basis:
    Item 2 ÷ Item 1.d.   64.5%

4. Book Value of Assets $4,049,820,000

5. Funded Ratio on a Book Value Basis:
    Item 4 ÷ Item 1.d.   54.5%

A review of the recent history of the funded ratio of the System is presented in Exhibit 4.

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STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

COMPARISON OF PRINCIPAL VALUATION RESULTS

A summary of the principal valuation results from the current valuation and from the previous valuation follows.

	Actuarial Valuation of the System as of	
	June 30, 1989	June 30, 1990
A. Summary of Data		
1. Number of Members		
a. Active	40,258	39,969
b. Terminated Vested and Inactive	1,922	1,905
c. Retired and Beneficiaries	13,164	13,804
d. Survivors and Dependents	504	502
	55,848	56,180
2. Characteristics of Active Members		
a. Total Compensation	$1,540,789,000	$1,663,765,000
b. Average Annual Compensation	$ 38,273	$ 41,626
c. Average Age	44.1	44.5
d. Average Service	14.6	14.9
B. Summary of Costs		
1. Normal Cost		
a. Amount	$127,787,000	$ 126,755,000
b. As a Percent of Covered Compensation	8.3%	7.6%
2. Actuarial Accrued Liability	$7,944,175,000	$8,221,679,000
3. Valuation Assets	$3,600,763,000	$4,260,808,000
4. Unfunded Actuarial Accrued Liability	$4,343,412,000	$3,960,871,000
5. State Contribution Requirement for Fiscal Year Ending 6/30/91 and 6/30/92, Respectively	$ 304,331,000	$ 308,724,000
C. Assets and Actuarial Present Values		
1. Assets		
a. Actuarial Value	$3,600,763,000	$4,260,808,000
b. Market Value	$4,136,564,000	$4,789,238,000
2. Actuarial Present Value of Credited Projected Benefits		
a. Member Contributions	$1,279,520,000	$1,396,710,000
b. Retired Members, Beneficiaries, Survivors, Dependents, and Other Inactive Teachers	2,052,961,000	2,359,947,000
c. Other Members	3,757,694,000	3,668,501,000
d. Total	$7,090,175,000	$7,425,158,000

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Exhibit 1

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

    1. Actuarial Accrued Liability for
       Retirement Benefits

	a. Member Contributions	$1,396,710,000
	b. Active Teachers	4,465,022,000
	c. Terminated Vested and Inactive Teachers	3,563,000
	d. Retired Teachers and Beneficiaries	2,343,489,000
	e. Survivors and Dependents	12,895,000
	f. Total	$8,221,679,000
2.	Actuarial Value of Assets	4,260,808,000
3.	Unfunded Actuarial Accrued Liability: Item 1f. - Item 2	$3,960,871,000

B. Normal Cost

1.	Normal Cost as of July 1, 1990	$126,755,000
2.	Annual Compensation of Active Teachers	1,663,765,000
3.	Normal Cost as a Percent of Annual Compensation	7.6%

Exhibit 2

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

DEVELOPMENT OF THE STATE CONTRIBUTION REQUIREMENT
FOR THE FISCAL YEAR ENDING JUNE 30, 1992

The State contribution requirement for the fiscal year ending June 30, 1992 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, 1991 and an estimate of the July 1, 1991 normal cost. This estimate was based on the July 1, 1990 normal cost and an estimate of future salary increases.

To develop the expected unfunded actuarial accrued liability as of June 30, 1990, the actual unfunded actuarial accrued liability as of June 30, 1990 was added to the normal cost as of July 1, 1990 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 actual State contributions 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 lia-bility and the contribution for the amendments to the System resulting from Public Acts 82-91 and 87-381 were developed separately. There was no normal cost associated with Public Acts 82-91 and 87-381 because they affected only retired Members.

The State contribution requirement for the fiscal year ending June 30, 1992 is $308,724,000.

Exhibit 2
(Continued)

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

DEVELOPMENT OF THE STATE CONTRIBUTION REQUIREMENT FOR THE FISCAL YEAR ENDING JUNE 30, 1992

		Provisions In Effect June 30, 1990	Public Act 82-91	Public Act 87-381	Total
1.	Unfunded Actuarial Accrued Liability as of 6/30/90	$3,928,875,000	$ 30,401,000	$ 1,595,000	$3,960,871,000
2.	Normal Cost as of 7/1/90	126,755,000	0	0	126,755,000
3.	Interest at 8.5% on (Item 1 + Item 2)	344,729,000	2,584,000	136,000	347,449,000
4.	State Contributions	(154,732,000)	(1,823,000)	(83,000)	(156,638,000)
5.	Interest to End of Year on Item 4	(8,136,000)	(96,000)	(4,000)	(8,236,000)
6.	Expected Unfunded Actuarial Accrued Liability as of 6/30/91	$4,237,491,000	$ 31,066,000	$ 1,644,000	$4,270,201,000
7.	Level Percent Amortization Payment (40/22/27 Years)	173,777,000	1,866,000	86,000	175,729,000
8.	Estimated Normal Cost	139,431,000	0	0	139,431,000
9.	Total: Item 7 + Item 8	$ 313,208,000	$ 1,866,000	$ 86,000	$ 315,160,000
10.	95% of Item 9 for Provisions in Effect 6/30/80; 100% of Item 11 for Subsequent Amendments	297,548,000	1,866,000	86,000	299,500,000
11.	State Contribution Requirement: Item 10 Adjusted with Interest for Payment Quarterly in Advance	$ 306,712,000	$ 1,923,000	$ 89,000	$ 308,724,000

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Exhibit 3

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

PROJECTED CONTRIBUTIONS BASED ON THE JUNE 30, 1990 VALUATION

The following tables contain projections of the State contribution requirements under three 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%, 8%, and 10% per year, assuming the number of active teachers will remain at 39,969. Results shown for 1980-1990 (which correspond to contributions for fiscal years 1982 - 1992) are based on actual valuations of the System. Results shown for the projection period from 1991 to 2032 (which correspond to contributions for fiscal years from 1993 to 2034) 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:

Fiscal Year Ending June 30,	Required Contribution	Actual Contribution
1989	$302,917,000	$282,917,000
1990	$348,639,000	$321,639,000
1991	$304,331,000	$156,638,000

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

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Table 1

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1990

(in thousands of dollars)

Teachers' Payroll is Assumed to Increase 6% per Annum Starting July 1, 1990

Actuarial Results as of June 30,

	Normal Cost	Unfunded Actuarial Accrued Liability
1980	$51,032	$1,818,569
1981	64,694	2,055,025
1982	69,601	2,284,380
1983	73,777	2,410,980
1984	107,293	3,261,067
1985	117,505	3,500,185
1986	132,310	3,818,585
1987	151,005	4,611,656
1988	173,335	4,788,106
1989	127,787	4,343,412
1990	126,755	3,960,871
1991	139,431	4,270,201
1992	147,797	4,459,493
1993	156,665	4,639,374
1994	166,065	4,823,592
1995	176,029	5,011,912
1996	186,591	5,204,047
1997	197,786	5,399,648
2002	264,682	6,412,460
2007	354,204	7,411,476
2012	474,004	8,228,926
2017	634,324	8,595,412
2022	848,868	7,999,982
2027	1,135,977	5,593,690
2032	1,520,194	0

Contribution Amounts for the Fiscal Year Ending June 30,

	Full Contribution	Percent of Payroll	Funding Percent	Required Contribution	Percent of Payroll	Fiscal Year	Teachers' Payroll for Fiscal Year
1982	$216,933	29.6%	35%	$75,927	10.3%	1980-81	$734,100
1983	238,861	31.0%	40%	96,798	12.6%	1981-82	769,500
1984	273,348	33.1%	45%	120,163	14.5%	1982-83	825,888
1985	289,579	32.7%	50%	145,959	16.5%	1983-84	886,409
1986	269,102	27.6%	65%	175,312	18.0%	1984-85	975,248
1987	290,771	27.3%	70%	203,987	19.2%	1985-86	1,065,077
1988	321,551	26.9%	75%	241,563	20.2%	1986-87	1,193,463
1989	378,216	27.6%	80%	302,917	22.1%	1987-88	1,369,950
1990	409,844	26.6%	85%	348,639	22.6%	1988-89	1,540,789
1991	337,934	20.3%	90%	304,331	18.3%	1989-90	1,663,765
1992	324,866	18.4%	95%	308,724	17.5%	1990-91	1,763,591
1993	341,574	18.3%	100%	341,574	18.3%	1991-92	1,869,406
1994	361,121	18.2%	100%	361,121	18.2%	1992-93	1,981,570
1995	381,790	18.2%	100%	381,790	18.2%	1993-94	2,100,464
1996	403,644	18.1%	100%	403,644	18.1%	1994-95	2,226,492
1997	426,754	18.1%	100%	426,754	18.1%	1995-96	2,360,082
1998	451,186	18.0%	100%	451,186	18.0%	1996-97	2,501,687
1999	477,021	18.0%	100%	477,021	18.0%	1997-98	2,651,788
2004	630,202	17.8%	100%	630,202	17.8%	2002-03	3,548,691
2009	832,693	17.5%	100%	832,693	17.5%	2007-08	4,748,949
2014	1,094,149	17.2%	100%	1,094,149	17.2%	2012-13	6,355,165
2019	1,445,826	17.0%	100%	1,445,826	17.0%	2017-18	8,504,644
2024	1,911,307	16.8%	100%	1,911,307	16.8%	2022-23	11,381,132
2029	2,527,001	16.6%	100%	2,527,001	16.6%	2027-28	15,230,522
2034	1,661,032	8.1%	100%	1,661,032	8.1%	2032-33	20,381,874

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

Table 2

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1990
(in thousands of dollars)

Teachers' Payroll is Assumed to Increase 8% per Annum Starting July 1, 1990

Actuarial Results as of June 30,

	Normal Cost	Unfunded Actuarial Accrued Liability
1980	$61,032	$1,818,569
1981	64,694	2,055,025
1982	69,601	2,284,380
1983	73,777	2,410,980
1984	107,293	3,261,067
1985	117,505	3,500,185
1986	132,310	3,818,585
1987	151,005	4,611,656
1988	173,335	4,788,106
1989	127,787	4,343,412
1990	126,755	3,960,871
1991	139,431	4,270,201
1992	150,585	4,548,015
1993	162,632	4,825,433
1994	175,643	5,116,723
1995	189,694	5,422,174
1996	204,870	5,742,014
1997	221,260	6,076,398
2002	325,104	7,964,745
2007	477,684	10,164,474
2012	701,876	12,468,591
2017	1,031,286	14,383,490
2022	1,515,297	14,780,679
2027	2,226,469	11,410,499
2032	3,271,414	0

Contribution Amounts for the Fiscal Year Ending June 30,

	Full Contribution	Percent of Payroll	Funding Percent	Required Contribution	Percent of Payroll		Teachers' Payroll for Fiscal Year
1982	$216,933	29.6%	35%	$75,927	10.3%	1980-81	$734,100
1983	238,861	31.0%	40%	96,798	12.6%	1981-82	769,500
1984	273,348	33.1%	45%	120,163	14.5%	1982-83	825,888
1985	289,579	32.7%	50%	145,959	16.5%	1983-84	886,409
1986	269,102	27.6%	65%	175,312	18.0%	1984-85	975,248
1987	290,771	27.3%	70%	203,987	19.2%	1985-86	1,065,077
1988	321,551	26.9%	75%	241,563	20.2%	1986-87	1,193,463
1989	378,216	27.6%	80%	302,917	22.1%	1987-88	1,369,950
1990	409,844	26.6%	85%	348,639	22.6%	1988-89	1,540,789
1991	337,934	20.3%	90%	304,331	18.3%	1989-90	1,663,765
1992	324,866	18.1%	95%	308,724	17.2%	1990-91	1,796,866
1993	348,189	17.9%	100%	348,189	17.9%	1991-92	1,940,615
1994	375,247	17.9%	100%	375,247	17.9%	1992-93	2,095,864
1995	404,410	17.9%	100%	404,410	17.9%	1993-94	2,263,533
1996	435,841	17.8%	100%	435,841	17.8%	1994-95	2,444,616
1997	469,719	17.8%	100%	469,719	17.8%	1995-96	2,640,185
1998	506,234	17.8%	100%	506,234	17.8%	1996-97	2,851,400
1999	545,590	17.7%	100%	545,590	17.7%	1997-98	3,079,512
2004	793,369	17.5%	100%	793,369	17.5%	2002-03	4,524,813
2009	1,153,837	17.4%	100%	1,153,837	17.4%	2007-08	6,648,435
2014	1,672,056	17.1%	100%	1,672,056	17.1%	2012-13	9,768,732
2019	2,432,925	17.0%	100%	2,432,925	17.0%	2017-18	14,353,472
2024	3,540,924	16.8%	100%	3,540,924	16.8%	2022-23	21,089,959
2029	5,153,948	16.6%	100%	5,153,948	16.6%	2027-28	30,998,069
2034	3,641,937	8.0%	100%	3,641,937	8.0%	2032-33	45,531,640

THE Wyatt COMPANY

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM

Table 3

PROJECTED CONTRIBUTIONS BASED ON THE ACTUARIAL RESULTS AS OF JUNE 30, 1990

(in thousands of dollars)

Teachers' Payroll is Assumed to Increase 10% per Annum Starting July 1, 1990

Actuarial Results as of June 30,			Contribution Amounts for the Fiscal Year Ending June 30,						Teachers' Payroll	
	Normal Cost	Unfunded Actuarial Accrued Liability		Full Contribution	Percent of Payroll	Funding Percent	Required Contribution	Percent of 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	17.8%	95%	308,724	16.9%	1990-91	1,830,142
1991	139,431	4,270,201	1993	354,807	17.6%	100%	354,807	17.6%	1991-92	2,013,156
1992	153,374	4,636,538	1994	389,645	17.6%	100%	389,645	17.6%	1992-93	2,214,472
1993	168,711	5,015,176	1995	427,912	17.6%	100%	427,912	17.6%	1993-94	2,435,919
1994	185,582	5,421,579	1996	469,940	17.5%	100%	469,940	17.5%	1994-95	2,679,511
1995	204,140	5,857,293	1997	516,103	17.5%	100%	516,103	17.5%	1995-96	2,947,462
1996	224,554	6,323,872	1998	566,806	17.5%	100%	566,806	17.5%	1996-97	3,242,208
1997	247,009	6,822,852	1999	622,495	17.5%	100%	622,495	17.5%	1997-98	3,566,429
2002	397,811	9,853,191	2004	994,721	17.3%	100%	994,721	17.3%	2002-03	5,743,770
2007	640,679	13,858,384	2009	1,589,840	17.2%	100%	1,589,840	17.2%	2007-08	9,250,399
2012	1,031,820	18,742,592	2014	2,535,185	17.0%	100%	2,535,185	17.0%	2012-13	14,897,860
2017	1,661,756	23,829,919	2019	4,054,642	16.9%	100%	4,054,642	16.9%	2017-18	23,993,153
2022	2,676,276	26,985,015	2024	6,485,781	16.8%	100%	6,485,781	16.8%	2022-23	38,641,213
2027	4,310,169	22,956,133	2029	10,375,033	16.7%	100%	10,375,033	16.7%	2027-28	62,232,060
2032	6,941,572	0	2034	7,870,887	7.9%	100%	7,870,887	7.9%	2032-33	100,225,355

THE Wyatt COMPANY

Exhibit 4

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

THE FUNDED STATUS OF THE SYSTEM

As noted in the Summary of Valuation Results, we have compared the market value of assets with the actuarial present value of accrued benefits to obtain one measure of how the System is meeting its obligation to fund benefits payable to its Members.

The actuarial present value of benefits (the liabilities under the System) was based on Members' service as of the valuation date and upon salary projected to retirement using the revised actuarial assumptions which are summarized in Exhibit 9. In attempting to compare the current results with those of prior years, it is crucial to keep in mind that the actuarial basis of the calculations has been changed. Therefore, the actuarial present value of benefits as of June 30, 1989 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).

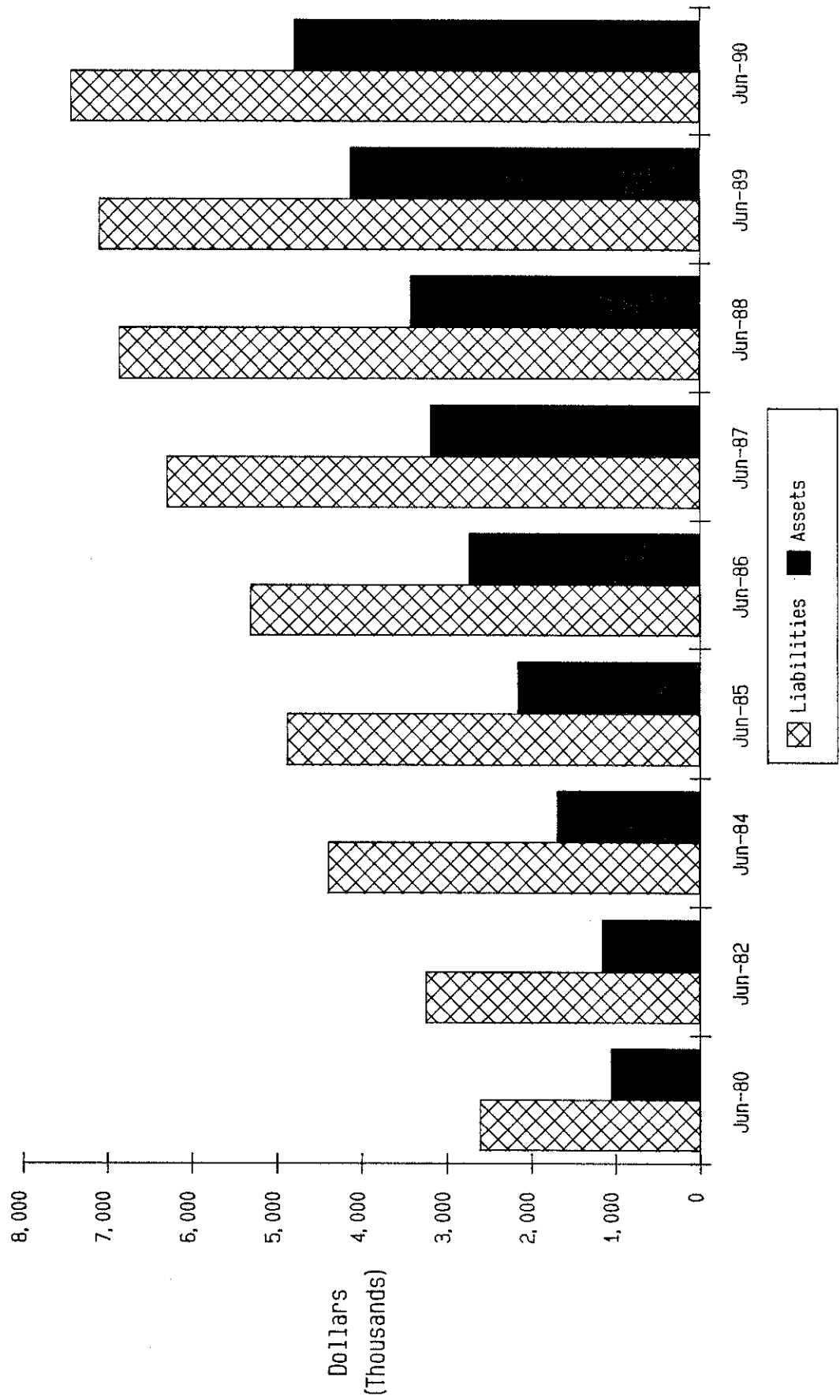| Fiscal Year Ending June 30	Market Value of Assets	Actuarial Present Value of Benefits	Funded Ratio	Unfunded Actuarial Present Value of Benefits	Annual Compensation	Unfunded Ratio
1980	$ 1,049,306,000	$ 2,603,702,000	40.3%	$ 1,554,396,000	$ 692,547,000	224.4%
1982	1,154,963,000	3,244,804,000	35.6%	2,089,841,000	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%
-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%

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 actuarial present value of accrued benefits 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.

STATE OF CONNECTICUT
STATE TEACHERS' RETIREMENT SYSTEM
COMPARISON OF LIABILITIES AND ASSETS

Graph 1

Dollars (Thousands)

Legend: ☒ Liabilities ■ Assets

Date		
Jun-80		
Jun-82		
Jun-84		
Jun-85		
Jun-86		
Jun-87		
Jun-88		
Jun-89		
Jun-90		

Y-axis: 0, 1,000, 2,000, 3,000, 4,000, 5,000, 6,000, 7,000, 8,000

THE Wyatt COMPANY

Teachers' Retirement Contribution
Estimated 1991-92
(In Millions)

Income

State Contribution	$140.0
Employee Contributions	110.0
Total Fund Income	$250.0

Out Go
Includes: Pensions, Survivor Benefits,
Refunds* $300.0

Shortfall** $(50.0)

*Includes:

Current (1990-91) monthly pension payroll	$ 20.0	million
New retirees	3.0	
5% Increase - COLA	1.2	
Total Estimated Monthly Payroll	$ 24.2	

Annual Pension Payroll	$290.4
Refunds & Survivorship Benefits	10.0
Total - Out Go	$300.0

Source: Discussions with Teachers' Retirement Board

**Will come from proceeds of sale of fund assets, i.e. negative cash flow.

Exhibit 5

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

<u>**RECONCILIATION OF THE MARKET VALUE OF ASSETS**</u>

A. <u>Reconciliation</u>

1.	Market Value of Assets as of July 1, 1989	$4,136,564,000
2.	Contributions (from State and Members)	428,561,000
3.	Benefit Payments:	
	a. Pension Payments	(206,074,000)
	b. Refund of Member Contributions	(6,783,000)
	c. Survivorship Benefits	(2,876,000)
4.	Net Investment Income	439,846,000
5.	Market Value of Assets as of June 30, 1990	$4,789,238,000

B. <u>Net Rate of Return on Market Value of Assets</u>   10.4%

STATE TEACHERS' RETIREMENT SYSTEM

DEVELOPMENT OF VALUATION 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, 1990, the actuarial value of assets as of July 1, 1989 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. Effective with the June 30, 1989 actuarial valuation, the expected rate of return is assumed to be the same as the discount rate used to determine costs and liabilities. 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, 1990 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.

1.	Actuarial Value of Assets as of July 1, 1989	$3,600,763,000
2.	Contributions	428,561,000
3.	Benefit Payments	215,733,000
4.	Net Transactions: Item 2 - Item 3	212,828,000
5.	Expected Rate of Return *(Previously CPI + 3%)* ~~9.5~~	8.5%
6.	Expected Investment Return: Item 5 x (Item 1 + ½ Item 4) *352,182,000*	315,110,000
7.	Expected Actuarial Value of Assets as of June 30, 1990: Item 1 + Item 4 + Item 6 *4,165,773,000*	4,128,701,000
8.	Market Value of Assets as of June 30, 1990	4,789,238,000
9.	Adjustments: 20% of the Difference between Item 8 and Item 7 *124,693,000*	132,107,000
10.	Preliminary Actuarial Value of Assets as of June 30, 1990: Item 7 + Item 9 *4,290,466,000*	4,260,808,000
11.	Limiting Values:	
	a. 80% of Item 8	3,831,390,000
	b. 120% of Item 8	5,747,086,000
12.	Actuarial Value of Assets as of June 30, 1990: Item 10, but not less than Item 11.a. or greater than Item 11.b.	$4,260,808,000

Exhibit 7

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

CENSUS DATA FOR MEMBERS IN THE SYSTEM

For the purposes of the June 30, 1990 actuarial valuation of the Connecticut State Teachers' Retirement System, we were provided with census data on each active teacher who was in the System as of the valuation date. 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, 1990, 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.

	June 30, 1989	June 30, 1990
1. Active Teachers		
a. Number	40,258	39,969
b. Average Age	44.1	44.5
c. Average Service	14.6	14.9
d. Average Annual Compensation	$ 38,273	$41,626
2. Terminated Vested Teachers		
a. Number	721	652
b. Average Monthly Deferred Benefit	$ 469	$ 465
3. Survivors and Dependents		
a. Number	504	502
b. Average Monthly Benefit	$ 266	$ 268
4. Retired Teachers and Beneficiaries		
a. Number	13,164	13,804
b. Average Monthly Benefit	$ 1,290	$ 1,399

Exhibit 7
(Continued)

The table below gives further details on the Retired Teachers and Beneficiaries as of June 30, 1990.

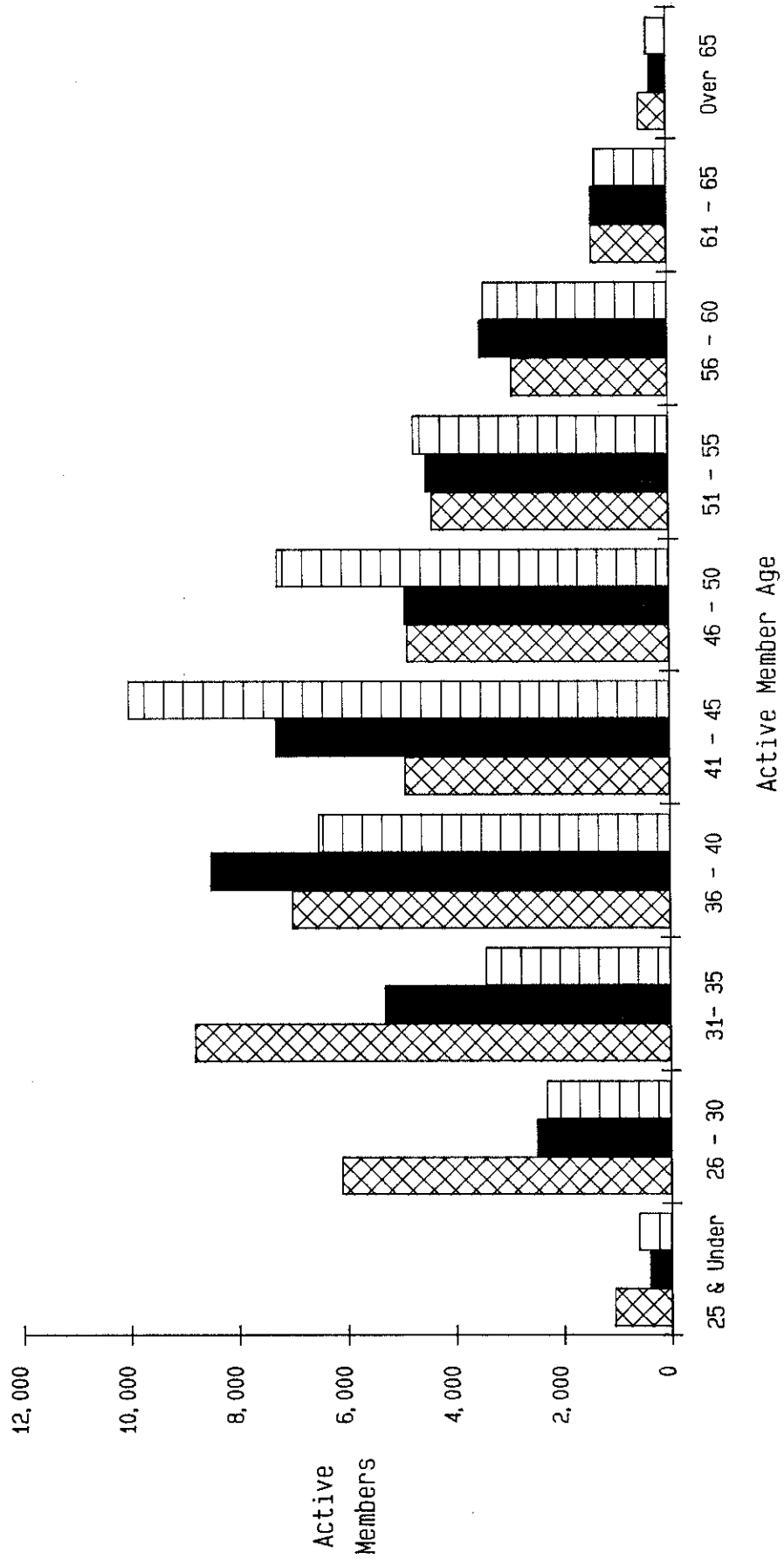| Age	Number	Avg. Mo. Benefit
Under 50	69	$ 1,078
50 - 54	159	1,263
55 - 59	876	1,630
60 - 64	2,804	1,666
65 - 69	2,780	1,524
70 - 74	2,283	1,317
75 - 79	1,920	1,217
80 - 84	1,595	1,195
85 - 89	914	1,118
90 -	404	1,060

The charts on the following pages present various characteristics of the Active Members of the System.

The first 3 charts give a distribution of the Active Members by age and completed years of service as of the valuation date. Separate charts are included for males, females, and all Members combined. Charts 4 through 6 show the average salaries for each age and service category.

2 factors - average up:
salaries ↑ : benefits ↑
$800 min → ↑ benefits - average went up

Graph 2

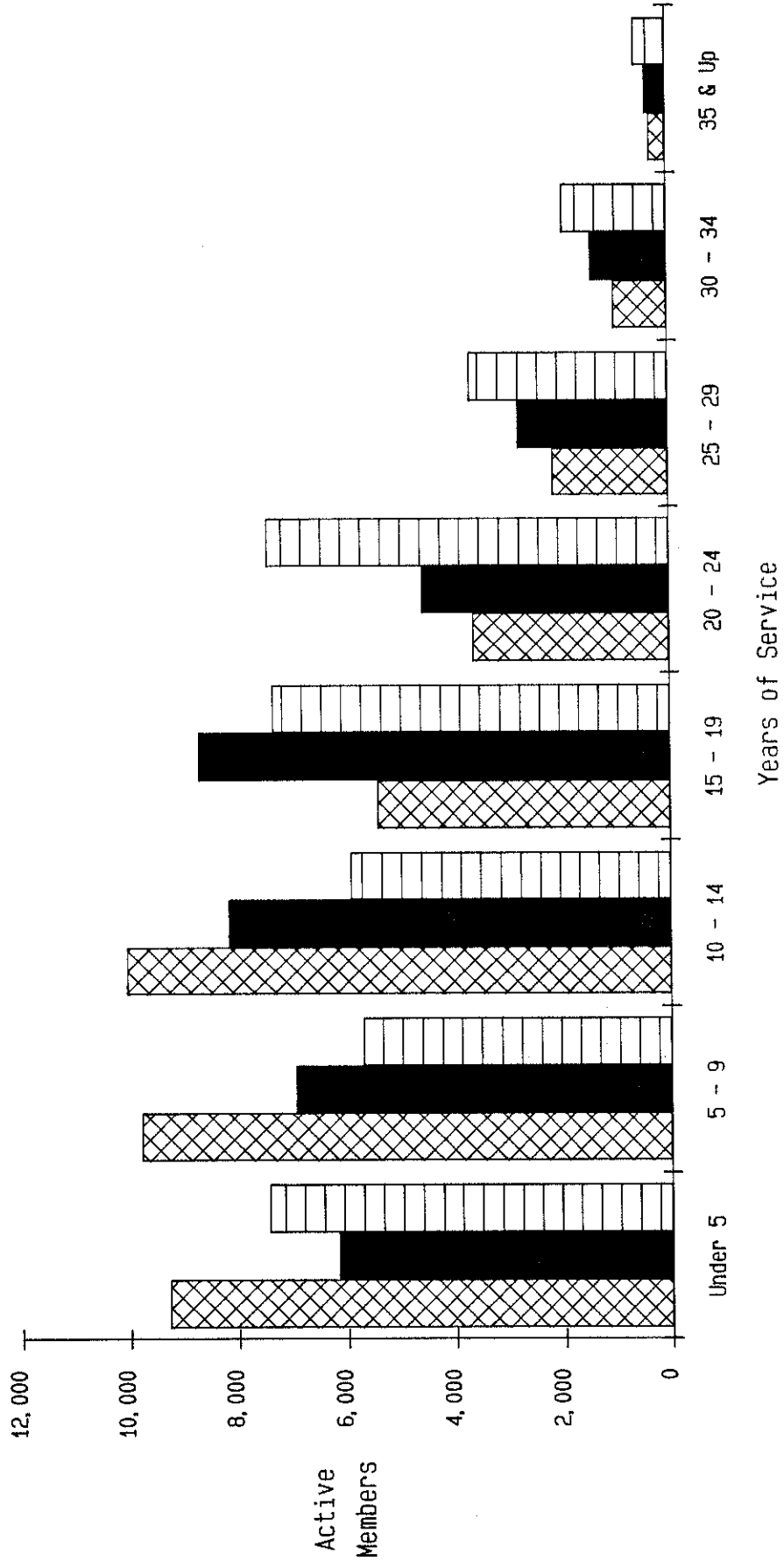STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

DISTRIBUTION OF ACTIVE MEMBERS BY AGE

1980, 1985 & 1990 COMPARISON

Active Members

Active Member Age

☒ As of June 30, 1980   ■ As of June 30, 1985   ☐ As of June 30, 1990

THE Wyatt COMPANY

Graph 3

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

DISTRIBUTION OF ACTIVE MEMBERS BY SERVICE

1980, 1985 & 1990 COMPARISON

Active
Members

Years of Service

⊠ As of June 30, 1980   ■ As of June 30, 1985   ☐ As of June 30, 1990

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Chart 1

STATE OF CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1990
(MALES ONLY)

NUMBER OF ACTIVE MEMBERS

COMPLETED YEARS OF SERVICE

AGE NRST BIRTHDAY AT VAL DATE	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	Total
20 - 24	4	17	9	0	0	0	0	0	0	0	0	0	0	30
25 - 29	15	56	66	69	50	56	1	0	0	0	0	0	0	313
30 - 34	13	45	69	78	74	341	115	0	0	0	0	0	0	735
35 - 39	17	60	52	72	53	270	637	334	0	0	0	0	0	1495
40 - 44	15	55	40	62	58	233	399	1370	887	0	0	0	0	3119
45 - 49	7	19	28	32	22	111	147	430	1580	573	0	0	0	2949
50 - 54	6	7	15	12	11	55	49	116	394	949	266	0	0	1880
55 - 59	3	3	8	12	6	18	36	77	175	372	718	87	0	1515
60 - 61	1	3	2	0	2	9	8	18	31	56	122	86	1	339
62 - 64	1	1	1	1	0	6	6	21	46	34	59	94	13	283
65 - 69	0	1	0	0	0	1	4	8	14	11	26	24	23	112
70 & up	0	0	0	0	0	1	0	2	7	2	3	3	3	21
Total	82	267	290	338	276	1101	1402	2376	3134	1997	1194	294	40	12791

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Chart 2

STATE OF CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1990
(FEMALES ONLY)

NUMBER OF ACTIVE MEMBERS

COMPLETED YEARS OF SERVICE

AGE NRST BIRTHDAY AT VAL DATE	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	Total
20 - 24	37	131	68	3	0	0	0	0	0	0	0	0	0	239
25 - 29	73	274	362	423	283	382	0	0	0	0	0	0	0	1797
30 - 34	41	165	208	253	257	1062	384	0	0	0	0	0	0	2370
35 - 39	52	235	257	249	227	783	1638	804	0	0	0	0	0	4245
40 - 44	80	258	351	370	351	1015	841	2117	1288	0	0	0	0	6671
45 - 49	38	128	181	227	232	830	823	710	1401	520	0	0	0	5090
50 - 54	8	29	57	80	70	342	479	590	606	539	232	0	0	3032
55 - 59	1	10	25	28	38	121	261	450	574	341	330	78	0	2257
60 - 61	1	2	2	7	7	22	41	128	181	94	73	48	3	609
62 - 64	0	2	0	2	2	17	26	96	155	101	50	31	19	501
65 - 69	0	0	0	0	0	9	12	58	74	57	46	22	20	300
70 & up	0	0	0	0	0	0	3	8	12	17	9	7	11	67
Total	331	1234	1511	1642	1469	4583	4508	4961	4291	1669	740	186	53	27178

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Chart 3

STATE OF CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1990
(ALL MEMBERS)

NUMBER OF ACTIVE MEMBERS

COMPLETED YEARS OF SERVICE

AGE NRST BIRTHDAY AT VAL DATE	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	Total
20 - 24	41	148	77	3	0	0	0	0	0	0	0	0	0	269
25 - 29	88	330	428	492	333	438	1	0	0	0	0	0	0	2110
30 - 34	54	210	277	331	331	1403	499	0	0	0	0	0	0	3105
35 - 39	69	295	309	321	280	1053	2275	1138	0	0	0	0	0	5740
40 - 44	95	313	391	432	409	1248	1240	3487	2175	0	0	0	0	9790
45 - 49	45	147	209	259	254	941	970	1140	2981	1093	0	0	0	8039
50 - 54	14	36	72	92	81	397	528	706	1000	1488	498	0	0	4912
55 - 59	4	13	33	40	44	139	297	527	749	713	1048	165	0	3772
60 - 61	2	5	4	7	9	31	49	146	212	150	195	134	4	948
62 - 64	1	3	1	3	2	23	32	117	201	135	109	125	32	784
65 - 69	0	1	0	0	2	10	16	66	88	68	72	46	43	412
70 & up	0	0	0	0	0	1	3	10	19	19	12	10	14	88
Total	413	1501	1801	1980	1745	5684	5910	7337	7425	3666	1934	480	93	39969

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Chart 4

STATE OF CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1990
(MALES ONLY)

AVERAGE ANNUAL SALARY

COMPLETED YEARS OF SERVICE

AGE NRST BIRTHDAY AT VAL DATE	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	Total
20 - 24	21440	24891	26312	0	0	0	0	0	0	0	0	0	0	24857
25 - 29	19969	25574	26481	27811	28770	28529	33400	0	0	0	0	0	0	27054
30 - 34	19964	28140	30520	29778	30299	32430	36508	0	0	0	0	0	0	31910
35 - 39	25022	33339	33567	36237	33660	36065	40507	45664	0	0	0	0	0	39703
40 - 44	23600	38136	42448	39511	40152	42480	44904	47460	48599	0	0	0	0	46448
45 - 49	32501	37532	41574	42780	49810	46272	48046	49197	49205	50981	0	0	0	49128
50 - 54	32072	43497	50676	46885	46432	46085	48273	48833	49239	50986	52687	0	0	50370
55 - 59	43386	50900	42600	39818	41381	52787	48795	48761	50041	50341	52796	54320	0	51438
60 - 61	15660	41565	49562	0	39625	40734	49448	51663	52677	50547	51755	54570	60304	51746
62 - 64	19440	75378	67000	24184	0	43242	45725	50779	52463	48759	50295	53860	61429	51894
65 - 69	0	33800	0	0	0	32500	41991	44929	47352	49213	50888	50413	56321	50235
70 & up	0	0	0	0	0	40063	0	47619	46504	51880	52684	49117	49536	48505
TOTAL	24505	32298	34362	34716	35245	37794	42777	47684	49152	50805	52500	53874	57572	46382

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THE Wyatt COMPANY

Chart 5

STATE OF CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1990
(FEMALES ONLY)

AVERAGE ANNUAL SALARY

AGE NRST BIRTHDAY AT VAL DATE	COMPLETED YEARS OF SERVICE													
	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	Total
20 - 24	17522	24486	24792	25120	0	0	0	0	0	0	0	0	0	23503
25 - 29	20163	25468	26764	27420	28348	29782	0	0	0	0	0	0	0	27344
30 - 34	20882	27216	29039	29406	30166	31493	35803	0	0	0	0	0	0	31128
35 - 39	22366	27388	29540	31773	32383	34473	38434	43997	0	0	0	0	0	36696
40 - 44	22562	28274	31388	33212	32921	35371	40530	45442	46351	0	0	0	0	40451
45 - 49	25261	29042	31555	33016	33693	35847	41670	45742	46907	47417	0	0	0	41768
50 - 54	24262	30270	30805	35357	36052	37088	41500	45841	46886	47593	48308	0	0	43886
55 - 59	26641	35538	32188	37484	37413	35921	41542	45393	46845	47055	48350	48886	0	45183
60 - 61	32996	22316	34068	37509	36465	36435	43431	47068	47161	46517	47475	47492	49003	46094
62 - 64	0	23666	0	31476	43744	37750	42606	45004	46532	48542	48074	48037	53062	46475
65 - 69	0	0	0	0	41105	37925	44043	47507	46607	48452	48141	48727	50602	47389
70 & up	0	0	0	0	0	0	43600	46810	41451	45686	48294	45151	53454	46538
TOTAL	21625	27107	29360	31067	31905	34101	39785	45354	46706	47435	48218	48225	51985	39388

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Chart 6

STATE OF CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM

AGE AND SERVICE DISTRIBUTION AS OF JUNE 30, 1990
(ALL MEMBERS)

AVERAGE ANNUAL SALARY

COMPLETED YEARS OF SERVICE

AGE NRST BIRTHDAY AT VAL DATE	0	1	2	3	4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	Over 39	Total
20 - 24	17904	24532	24969	25120	0	0	0	0	0	0	0	0	0	23654
25 - 29	20130	25486	26720	27475	28411	29622	33400	0	0	0	0	0	0	27301
30 - 34	20661	27414	29408	29494	30195	31721	35966	0	0	0	0	0	0	31313
35 - 39	23020	28598	30217	32775	32625	34881	39014	44486	0	0	0	0	0	37479
40 - 44	22726	30007	32520	34116	33946	36698	41937	46235	47268	0	0	0	0	42361
45 - 49	26387	30139	32897	34223	35089	37076	42636	47046	48125	49285	0	0	0	44468
50 - 54	27609	32842	34945	36861	37462	38335	42129	46333	47813	49757	50647	0	0	46368
55 - 59	39200	39083	38184	38184	37954	38105	42421	45885	47592	48770	51396	51752	0	47695
60 - 61	24328	33865	41815	37509	37167	37683	44414	47634	47968	48021	50153	52034	51828	48115
62 - 64	19440	40903	67000	29045	43744	39183	43191	46040	47890	48597	49276	52416	56461	48431
65 - 69	0	33800	0	0	41105	37382	43530	47194	46726	48575	49133	49607	53661	48163
70 & up	0	0	0	0	0	40063	43600	46971	43312	46338	49392	46341	52614	47007
TOTAL	22197	28030	31690	32433	34816		40495	46108	47738	49271	50861	51685	54388	41626

THE Wyatt COMPANY

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Exhibit 8

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 this valuation.

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.

Exhibit 8
(Continued)

5. Normal Retirement - continued

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 mini-
mum 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.

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Exhibit 8
(Continued)

8. <u>Disability Retirement</u>

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. <u>Termination of Employment</u>

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. <u>Pre-Retirement Death Benefits</u>

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.

Exhibit 8
(Continued)

10. Pre-Retirement Death Benefits
    (continued)

    ● 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 5% 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).

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Exhibit 8
(Continued)

12. <u>Cost-of-Living Allowance</u>

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.

13. <u>Teachers' Required Contribution</u>

Each teacher is required to contribute 6% of annual salary. Effective July 1, 1989, the total of all 6th percent contributions made after June 30, 1989 will be used for health insurance for retired teachers, except for the first $500,000 of such total.

14. <u>State Contribution</u>

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

Exhibit 9

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

SUMMARY OF ACTUARIAL ASSUMPTIONS AND ACTUARIAL COST METHOD

The following is a summary of the actuarial assumptions and the actuarial cost methods used in this valuation of the State Teacher's Retirement System. These are the same assumptions and methods that were used in the prior year's valuation.

A. Actuarial Assumptions

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:

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

4. Salary Increases:

perhaps "too ambitious" 3/13/91

Years of Service	Rate
0 - 15	8.0%*
16 and above	5.5%*

*plus 4.0% from 7/1/89 to 6/30/93

5. Cost-of-Living Increases: Annual increases in pensions of 4% after retirement.

6. Retirement Age:

Age	Percent Expected to Retire
55	1%
56-59	5%
60-64	15%
65	20%
66	24%
67	28%
68	32%
69	36%
70	40%
71	52%
72	64%
73	76%
74	88%
75	100%

Exhibit 9
(Continued)

7. Disability Incidence: Sample Rates:

Age	Rate
30	.059%
40	.105%
50	.262%

8. Active Member Marriage Assumptions:

85% of all Members are married. Females are 3 years younger than their spouse, and have one child at age 25 and another at age 27.

9. Expenses:

Paid directly by the State.

B. Actuarial Cost Method;
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. The starting value used with this technique is the market value of assets as of June 30, 1980.

Exhibit 10

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

DESCRIPTION OF THE ENTRY AGE ACTUARIAL COST METHOD

The objective of this actuarial cost method, as applied to a pension plan with a pay-related formula, is to express the cost attributable to the current year's employment for each participant as a level percent of the participant's salary.

The expected pension benefit at normal retirement is determined for each participant based on projected service at normal retirement and on salary projected to normal retirement using the assumed salary progression.

Normal Cost (also called "Current Service Cost") - For each participant, a level percent called the "Normal Cost Rate" is calculated. The Normal Cost Rate is calculated so that if each year that percent of the participant's salary for the year were paid into the fund from the earliest time the participant would have been eligible to join the plan (hence, entry age) until his retirement or termination, the payments would accumulate with interest (at the assumed valuation rate) to an amount sufficient to pay all benefits under the plan for that participant.

A participant's Normal Cost for a given plan year is the product of his Normal Cost Rate and his salary for that plan year.

The Normal Cost for the plan is the sum of the Normal Costs for the individual participants.

Actuarial Accrued Liability (also called "Past Service Liability") - The Actuarial Accrued Liability is determined as the theoretical amount that would have accumulated in the fund had annual contributions equal to the Normal Cost been made in each year prior to the valuation date. (It does not represent the liability for benefits accrued as of the valuation date.)

The Actuarial Accrued Liability for the plan is the sum of the Actuarial Accrued Liabilities for the individual participants.

The Unfunded Actuarial Accrued Liability (Unfunded Past Service Liability) is the excess of the Actuarial Accrued Liability (Past Service Liability) over the value of the plan assets.

The calculation of the Normal Cost and the Actuarial Accrued Liability takes into account the time value of money (by discounting for interest), expected increases in compensation (through salary progression), and appropriate probabilities of disability, termination, retirement, and death.

Exhibit 11

STATE OF CONNECTICUT

STATE TEACHERS' RETIREMENT SYSTEM

DESCRIPTION OF THE PROJECTED UNIT CREDIT ACTUARIAL COST METHOD

Under this actuarial cost method, the cost attributable to past employment (i.e., prior to the valuation date) and to the current year's employment for each participant is determined by prorating the pension benefit expected to be paid upon normal retirement over all years of service.

The expected pension benefit at normal retirement is determined for each participant based on service as of the valuation date but on salary projected to normal retirement using the assumed salary progression.

Normal Cost (also called "Current Service Cost") - The Normal Cost is calculated as the actuarial present value as of the valuation date of the current year's portion of the employee's expected pension benefit. The current year's portion equals the expected pension benefit divided by the total number of years of the participant's service at normal retirement.

The Normal Cost for the plan is the sum of the Normal Costs for the individual participants.

Actuarial Accrued Liability (also called "Past Service Liability") - The Actuarial Accrued Liability is determined as the actuarial present value as of the valuation date of the past years' (i.e., prior to the valuation date) portion of the participant's expected pension benefit. The past years' portion is equal to the expected pension benefit times the ratio of the number of years between the participant's date of participation and the valuation date to the number of years between his date of participation and his normal retirement date.

The Actuarial Accrued Liability for the plan is the sum of the Actuarial Accrued Liabilities for the individual participants.

The Unfunded Actuarial Accrued Liability (Unfunded Past Service Liability) is the excess of the Actuarial Accrued Liability (Past Service Liability) over the value of plan assets.

The calculation of the Normal Cost and the Actuarial Accrued Liability takes into account the time value of money (by discounting for interest), expected increases in compensation (through salary progression), and appropriate probabilities of disability, termination, retirement, and death.

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