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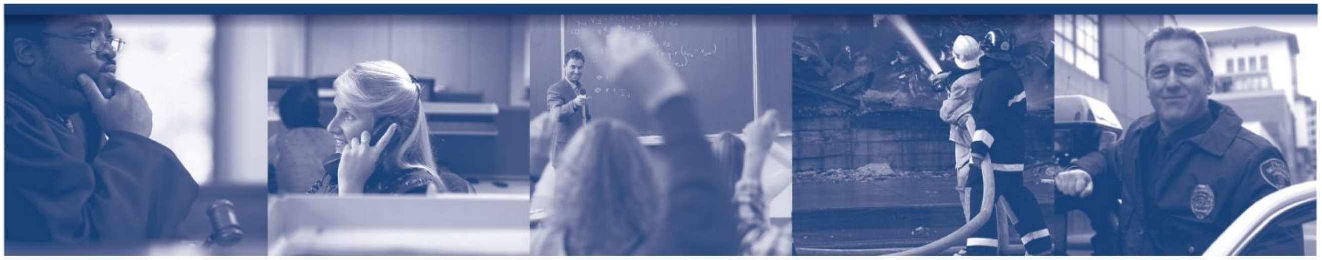
Teachers' Retirement Board

Connecticut State Teachers' Retirement System
Actuarial Valuation
as of June 30, 2012



Cavanaugh Macdonald
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October 24, 2012

Board of Directors
Connecticut State Teachers' Retirement System
765 Asylum Avenue
Hartford, CT 06105

Members of the Board:

The laws governing the operation of the Connecticut State Teachers' Retirement System provide that actuarial valuations of the assets and liabilities of the System shall be made at least once every two years. We have conducted the actuarial valuation of the System as of June 30, 2012 and the results of the valuation are contained in the following report.

In performing the valuation, we relied on data supplied by the System and performed limited tests on the data for consistency and reasonableness. The valuation was prepared in accordance with the funding objectives of the System as set forth in Chapter 167a, Section 10-183z of the Connecticut General Statutes. The normal cost and accrued liability of the System are developed using the entry age normal cost method. Under this method, the normal cost is the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

In determining the System's liabilities, future events, such as investment returns, salary increases, deaths, retirements, etc., are anticipated based upon the set of actuarial assumptions as approved by the Board. Since the previous valuation, the assumptions have been revised to reflect the results of the experience study prepared as of June 30, 2010 and adopted by the Board on April 7, 2011. The assets of the system for valuation purposes are developed using an asset smoothing technique which spreads the recognition of the unexpected portion of market related gains and losses over a period of four years with the goal of dampening the impact of market volatility upon valuation results.

An unfunded accrued liability exists in the amount equal to the excess of accrued liability over valuation assets. The accrued liability contribution was determined in accordance with subsections (b) and (c) of Section 10-183z of the Statutes. In our opinion, the System continues to operate on an actuarially sound basis.

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Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal annual actuarial valuation, an analysis of the range of results is not presented herein.

This is to certify that the independent consulting actuary is a member of the American Academy of Actuaries and has experience in performing valuations for public retirement systems, that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions and methods that are internally consistent and reasonable, based on the actual experience of the System.

Respectfully submitted,

John J. Garrett, ASA, FCA, MAAA
Principal and Consulting Actuary

Cathy Turcot
Principal and Managing Director

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Senior Actuary

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The table below summarizes the results of the June 30, 2012 actuarial valuation as compared with the prior year.

Table I-1: Comparative Summary of Principal Results

	June 30, 2010	June 30, 2012
Membership		
Active Members		
Number	51,368	49,808
Annual Payroll	$3,645,974	$3,652,518
Retirees and Beneficiaries		
Number	30,493	32,294
Annual Benefits	$1,364,689	$1,531,493
Inactive Members		
Vested	1,315	1,609
Non-Vested	11,315	12,276
Assets		
Market Value	$12,273,604	$13,473,656
Actuarial Value	$14,430,187	$13,734,831
Return on Market Value	13.45%	9.45%*
Return on Actuarial Value	1.17%	1.72%*
Ratio of Actuarial to Market Value	117.57%	101.94%
Actuarial Information		
Unfunded Actuarial Liability (UAL)	$9,065,729	$11,127,397
Funded Ratio	61.42%	55.24%
Computed Contribution Rates		
Normal Cost	10.11%	9.73%
Unfunded Accrued Liability	15.09%	20.40%
Total	25.20%	30.13%
Member	6.00%	6.00%
State	19.20%	24.13%
State Contribution Amount for Fiscal Year Ending		
June 30, 2012	$757,246	
June 30, 2013	$787,536	
June 30, 2014		$948,540
June 30, 2015		$984,110

All dollar amounts are in thousands.

***** Two year compounded return.

Summary of Key Findings

The employer contribution rate for the System is used to pay the employer's portion of the normal cost and to amortize the unfunded actuarial accrued liability (UAAL).

The actuarially determined normal cost contribution rate decreased from 10.11% as of June 30, 2010 to 9.73% as of June 30, 2012. This decrease is primarily due to the changes in actuarial assumptions as a result of the experience study prepared as of June 30, 2010. The unfunded actuarial accrued liability increased from \$9.066 billion to \$11.127 billion over the two year period. The unfunded actuarial accrued liability rate increased from 15.09% to 20.40%. We note the following key findings:

- The UAAL decreased by \$89 million due to the changes in actuarial assumptions as a result of the experience study prepared as of June 30, 2010.
- The UAAL grew by \$1.555 billion due to interest and decreased by \$1.009 billion due to the amortization payments over the two year period.
- The System experienced actuarial losses on plan assets of \$1.000 billion for fiscal year 2011 and \$888 million for fiscal year 2012 as a result of the investment return on the actuarial value of assets being less than the assumed rate. Table III-3 provides the calculation of the investment losses for the two- year period.
- The System experienced a net actuarial gain of \$490 million as of June 30, 2011 and a net actuarial loss of \$206 million as of June 30 2012 on plan liabilities due to non-investment related experience. Table IV-2 provides the reconciliation of the UAAL which is summarized as follows:
    1. The System provides post-retirement Cost-of-Living Adjustments based upon certain criteria set forth in the statutes. For purposes of the valuation, the benefits paid to eligible retirees and beneficiaries are expected to increase at a rate of 3.00% annually for members retired before September 1992 and 2.0% for members retired on and after September 1, 1992. The actual COLAs granted for members retired before September 1, 1992 were 3.0% or 4.1% depending on the member's COLA date for 2011 and 3.8% or 3.0% for 2012. The actual COLAs granted for members retired on and after September 1, 1992 were 0.0% for 2011 and 3.6% for 2012. This resulted in a \$183 million gain to the System in 2011 and a \$180 million loss to the system in 2012.
    2. The System experienced a \$272 million gain due to salary experience for 2011 and an \$18 million loss due to salary experience for 2012.
    3. In addition, there were gains and losses primarily attributable to the System turnover experience. The gain for 2011 was \$36 million and the loss for 2012 increased plan liabilities by \$8 million.

Section II of the report provides summarized information on the membership data used in the valuation. Section III of the report covers the System's assets and Section IV of the report covers the System's liabilities. The results of the valuation are provided in Section V of the report and the accounting information is in Section VI. The appendices provide additional information on: A) the System members; B) the actuarial assumptions and methods; and C) the summary of plan provisions. In addition, Appendix D provides a glossary of actuarial terminology. It should be noted that all information contained in this report for periods prior to June 30, 2009 was produced by a prior actuarial consulting firm.

Data regarding the membership of the System for use in the valuation were furnished by the Retirement Systems. The following table summarizes the membership data as of June 30, 2012 and is compared with that reported for the prior valuation.

Table II-1: Summary of Membership Data

	June 30, 2010	June 30, 2012
Active Members		
Total Number of Active Members	51,368	49,808
Total Annual Compensation	$3,645,974	$3,652,518
Retirees and Beneficiaries		
Number of Service Retirements	28,616	30,399
Total Annual Benefit Payments	$1,317,048	$1,480,064
Number of Disability Retirements	274	262
Total Annual Benefit Payments	$6,979	$6,470
Number of Beneficiaries	1,603	1,633
Total Annual Benefit Payments	$40,663	$44,959
Inactive Members		
Number of Non-vested Inactive Members	11,315	12,276
Number of Vested Inactive Members	1,315	1,609

All dollar amounts are in thousands.

The following tables provide information on the System's assets.

Table III-1: Market Value Reconciliation

	2010 - 2011	2011 - 2012
Net Market Value as of July 1	$12,273,604	$14,143,881
Additions		
State Contributions	$581,593	$757,246
ERIP Contributions	$ 902	$ 582
Employee Contributions	$255,244	$262,921
Change in Net Appreciation	$1,857,980	($687,609)
Interest and Dividends	$456,953	$368,859
Gain on Sale of Securities	$202,551	$173,279
Total Additions	$3,355,223	$875,278
Deductions		
Benefit Payments	($1,484,946)	($1,545,503)
Net Increase	$1,870,277	($670,225)
Net Market Value as of June 30	$14,143,881	$13,473,656
Rate of Return on Market Value	21.07%	(1.05)%
Two Year Compounded Return		9.45%

All dollar amounts are in thousands.

Development of Actuarial Value of Assets

The Actuarial Value of Assets represents a "smoothed" value developed with the purpose to dampen the impact of market volatility on the assets used in determining valuation results. The Actuarial Value of Assets has been calculated by spreading the recognition of excess investment income over four years. The amount of excess investment income in each year is the difference between expected investment income on actuarial value and the actual market value investment income. Table III-2 provides the development of the actuarial value of assets over the two year period since the previous valuation.

Table III-2: Development of Actuarial Value of Assets

		June 30, 2011	June 30, 2012
1.	Actuarial Value Beginning of Year	$14,430,187	$13,981,667
2.	Market Value End of Year	$14,143,881	$13,473,656
3.	Market Value Beginning of Year	$12,273,604	$14,143,881
4.	Cash Flow		
	a. Contributions	$837,739	$1,020,749
	b. Disbursements	($1,484,946)	($1,545,503)
	c. Net: 4a + 4b	($647,207)	($524,754)
5.	Investment Income		
	a. Market Total: 2 – 3 – 4c	$2,517,484	($145,471)
	b. Assumed Rate of Return	8.50%	8.50%
	c. Amount for Immediate Recognition: (1 x 5b) + (4c x 5b x 0.5)	$1,199,060	$1,166,141
	d. Amount for Phased-In Recognition: 5a – 5c	$1,318,424	($1,311,612)
6.	Phased-In Recognition of Investment Income		
	a. Current Year: 5d * .25	$329,606	($327,903)
	b. First Prior Year	$63,321	$329,606
	c. Second Prior Year	($953,247)	$63,321
	d. Third Prior Year	($440,053)	($953,247)
	e. Total Recognized Investment Gain	($1,000,373)	($888,223)
7.	Total Recognized Investment Return: 5c + 6e	$198,687	$277,918
8.	Actuarial Value End of Year: 1 + 4c + 7	$13,981,667	$13,734,831
9.	Difference Between Market & Actuarial Values: 2 – 8	$162,214	($261,175)
10.	Rate of Return on Actuarial Value	1.41%	2.03%
11.	Two Year Compounded Return		1.72%

All dollar amounts are in thousands.

The actuarial valuation assumes the investment income on the assets of the System is 8.50% annually. This assumption is based upon the reasonable long-term expected return on the assets. In each year, the System will experience actuarial gains and losses due to the actual investment return of the assets.

Table III-3: Calculation of Actuarial Investment Gain/(Loss)

	June 30, 2011	June 30, 2012
1. Actuarial Value of Assets at Beginning of Year	$14,430,187	$13,981,667
2. Total Net Cash Flow	($647,207)	($524,754)
3. Expected Return on Actuarial Value of Assets: (1 x 8.50% + 2 x 8.50% x .5)	$1,199,060	$1,166,141
4. Expected Actuarial Value of Assets at End of Year: (1 + 2 + 3)	$14,982,040	$14,623,054
5. Actual Actuarial Value of Assets at End of Year	$13,981,667	$13,734,831
6. Actuarial Gain/(Loss) Due to Investment Experience: (5 - 4)	($1,000,373)	($888,223)

All dollar amounts are in thousands.

The present value of benefits is the value as of the valuation date of all future benefits expected to be paid to current members of the System. An actuarial cost method allocates each individual's present value of benefits to past and future years of service. The actuarial accrued liability includes the portion of the active member present value of benefits allocated to past service as well as the entire present value of benefits for retirees, beneficiaries and inactive members. The unfunded actuarial accrued liability (UAAL) is the difference between the actuarial accrued liability and the actuarial value of assets. Table IV-1 shows the allocation of the present value of future benefits into components for future normal cost contributions and actuarial accrued liabilities and the determination of the UAAL as of the valuation date.

Table IV-1: Calculation and Allocation of Present Value of Future Benefits

		Entry Age Actuarial Cost Method	
	(1) Present Value of Future Benefits	**(2) Portion Covered By Future Normal Cost Contributions**	**(3) Actuarial Accrued Liabilities (1) - (2)**
Active Members			
Service Retirement	$11,977,467	$2,764,887	$9,212,580
Disability Retirement	157,250	104,881	52,369
Survivors' Benefits	189,351	56,561	132,790
Termination	477,594	441,212	36,382
Total for Active Members	12,801,662	3,367,541	9,434,121
Inactive Members			
Non-Vested (Refund only)	224,046	0	224,046
Vested	213,899	0	213,899
Total for Inactive Members	437,945	0	437,945
Retirees and Beneficiaries			
Service Retirements	14,526,347	0	14,526,347
Disability Retirements	70,027	0	70,027
Beneficiaries	393,788	0	393,788
Total for Retirees and Beneficiaries	14,990,162	0	14,990,162
Total	$28,229,769	$3,367,541	$24,862,228
Actuarial Value of Assets			$13,734,831
Unfunded Actuarial Accrued Liability			$11,127,397
Funded Ratio			55.24%

All dollar amounts are in thousands.

The funded ratio of the System is the ratio of the actuarial value of assets divided by the actuarial accrued liability as of the valuation date. As of June 30, 2012, the funded ratio of the System is 55.24% as compared to the ratio in the prior valuation of 61.42%. The decline in the funded ratio is primarily attributable to the recognition of the net investment experience over the past four years. The ratio is a commonly used measure of the funding progress of a System and can be useful in reviewing the historical trend of a System's funding progress. Such a review should also consider the impact to this measure over the historical period due to changes to plan benefits, changes to the actuarial assumptions and methods, and the significant impact that investment experience can have on the ratio over short-term periods. We caution that no single "point in time" measure can provide a universal basis for comparing one System to another.

Although the terminology used to describe the excess of the System's actuarial accrued liability over the System's actuarial value of assets is called the "unfunded" actuarial accrued liability, there is a dedicated source of funding for this liability. The scheduled employer and employee contributions are expected to completely fund the System's liabilities (pay off the UAAL) based on statutory funding requirements.

The calculation of the System's actuarial assets and liabilities require the use of several assumptions concerning the future experience of the System and its members. In each valuation, the latest year of actual experience is compared to that expected by the prior valuation. The differences are actuarial gains and losses which decrease or increase the UAAL. Table IV-2 provides for the reconciliation of the UAAL and shows the primary sources of this year's gains and losses due to actuarial experience.

Table IV-2: Reconciliation of the UAAL

1.	UAAL as of June 30, 2010	$9,065,729
2.	Change due to experience study	(88,897)
3.	UAAL after experience study (1 + 2)	8,976,832
4.	Expected Amortization Payment	(413,348)
5.	Expected Interest (3 x 8.50% + 4 x 8.50% x .5)	745,463
6.	Expected End of Year UAAL (3 + 4 + 5)	$9,308,947
7.	Actuarial Experience (Gain)/Loss	
	Asset Experience	1,000,373
	COLA	(182,922)
	Salary Experience	(271,564)
	Post-retirement Mortality	(3,238)
	Retirements	(4,521)
	Turnover and Other	(27,994)
	Total Actuarial (Gain)/Loss	$510,134
8.	UAAL as of June 30, 2011 (6 + 7)	$9,819,081
9.	Expected Amortization Payment	(595,169)
10.	Expected Interest (8 x 8.50% + 9 x 8.50% x .5)	809,327
11.	Expected End of Year UAAL (8 + 9 + 10)	$10,033,239
12.	Actuarial Experience (Gain)/Loss	
	Asset Experience	888,222
	COLA	180,388
	Salary Experience	17,527
	Post-retirement Mortality	6,199
	Retirements	(1,403)
	Turnover and Other	3,225
	Total Actuarial (Gain)/Loss	$1,094,158
13.	UAAL as of June 30, 2012 (11 + 12)	$11,127,397

All dollar amounts are in thousands.

Section IV of this report presented the System's total present value of future benefits allocated between the present value of future normal cost contributions and actuarial accrued liability. The portion of the active members' present value of benefits allocated to future years of service is funded through annual normal cost contributions comprised of both active member and employer contributions. The System's annual normal cost rate is calculated as a percent of covered payroll, which is expected to remain level over all future years of service. The portion of the total normal cost rate in excess of the active member contribution rate is the state normal cost rate. The normal cost rate developed as of the valuation date is presented in Table V-1. Table V-1 also shows the state contribution rates necessary to amortize the UAAL in accordance with the funding requirements in the statutes.

Table V-1: State Contribution Rate

Normal Cost Rate of Active Members by Expected Benefit Type	
Service Retirement	7.99%
Termination	1.25%
Disability Retirement	0.32%
Survivors' Benefits	0.17%
Total Normal Cost Rate for Active Members	9.73%
Less: Active Member Contribution Rate	6.00%
State Normal Cost Rate	3.73%
Unfunded Actuarial Accrued Liabilities	
Plan in effect 6/30/1991 (19 years)	23.28%
Public Act 82-91 (0 years)	0.00%
Public Act 87-381 (5 years)	0.01%
Public Act 92-205 (10 years)	(4.84)%
Public Act 98-251 (15 years)	0.02%
Public Act 07-186 (25 years)	1.93%
Total	20.40%
State Contribution Rate	24.13%

1. Governmental Accounting Standards Board Statements 25 and 27 set forth certain items of required supplementary information to be disclosed in the financial statements of the System and the employer. One such item is a distribution of the number of employees by type of membership, as follows:

Table VI-1: Number of Active and Retired Members as of June 30, 2012	
Retired members and beneficiaries currently receiving benefits	32,294
Vested inactive members	1,609
Non-Vested inactive members	12,276
Active members	49,808
Total	95,987

2. Another such item is the schedule of funding progress as shown below

Table VI-2: Schedule of Funding Progress

Actuarial Valuation as of June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a % of Active Member Payroll [(b) - (a)] / (c)
1998	$7,721.1	$10,970.1	$3,249.0	70.4%	$2,298.9	141.3%
2000	9,605.9	11,797.6	2,191.7	81.4	2,501.5	87.6
2002	10,387.3	13,679.9	3,292.6	75.9	2,698.3	122.0
2004	9,846.7	15,070.5	5,223.8	65.3	2,930.8	178.2
2006	10,190.3	17,112.8	6,922.5	59.5	3,137.7	220.6
2008	15,271.0	21,801.0	6,530.0	70.0	3,399.3	192.1
2010	14,430.2	23,495.9	9,065.7	61.4	3,646.0	248.6
2012	13,734.8	24,862.2	11,127.4	55.2	3,652.5	304.7

All dollar amounts are in millions

All figures prior to 6/30/2010 were reported by the prior actuarial firm.

3. The following shows the schedule of employer contributions.

Table VI-3: Schedule of Employer Contributions

Fiscal Year Ending June 30	Annual Required Contribution	Actual Contributions	Percent Contributed
2003	$221,236,492	$179,823,603	81.3%
2004	270,544,487	185,348,144	68.5%
2005	281,366,266	185,348,143	65.9%
2006	396,248,625	396,248,844	100.0%
2007	425,285,724	412,101,958	96.9%
2008	518,560,263	2,518,560,263	485.7%
2009	539,302,674	539,302,674	100.0%
2010	559,224,245	559,224,244	100.0%
2011	581,593,215	581,593,216	100.0%
2012	757,246,000	757,246,000	100.0%

All dollar amounts are in thousands.

For fiscal year ending June 30, 2008, bond proceeds amounting to $2 billion were deposited into the fund, in addition to the normal State contribution.

4. The information presented in the required supplementary schedules was determined as part of the actuarial valuation as of June 30, 2012. Additional information as of the latest actuarial valuation follows.

Table VI-4: Additional Information	
Valuation date	June 30, 2012
Actuarial cost method	Entry Age
Amortization period	Level percent closed
Remaining amortization periods	
Plan in effect 6/30/1991	19 years
Public Act 82-91	0 years
Public Act 87-381	5 years
Public Act 92-205	10 years
Public Act 98-251	15 years
Public Act 07-186	25 years
Equivalent single amortization period	22.4 years
Asset valuation method	Four-year smoothed market value
Actuarial assumptions:	
Investment rate of return (includes inflation)	8.50%
Projected salary increases (includes inflation)	3.75% - 7.00%
Inflation	3.00%
Cost-of-living adjustments	
Retirements prior to September 1, 1992	3.0%
Retirements on or after September 1, 1992	2.0%

Table A-1: Schedule of Active Participant Data as of June 30, 2012

	Years of Service								
AGE	**Under 5**	**5 to 9**	**10 to 14**	**15 to 19**	**20 to 24**	**25 to 29**	**30 to 34**	**35 & up**	**Total**
Under 25	474	2							476
Avg. Pay	41,163	57,239							41,231
25 to 29	3,491	1,038							4,529
Avg. Pay	47,095	53,739							48,617
30 to 34	1,829	4,237	704	2					6,772
Avg. Pay	51,740	59,551	69,964	69,941					58,527
35 to 39	765	2,078	3,197	292					6,332
Avg. Pay	54,992	64,179	75,137	87,501					69,677
40 to 44	645	1,409	2,482	2,033	191				6,760
Avg. Pay	55,258	65,951	76,642	87,308	90,572				75,974
45 to 49	538	1,137	1,386	1,265	973	302			5,601
Avg. Pay	53,957	64,987	76,979	86,203	88,738	89,344			77,126
50 to 54	397	923	1,257	854	728	1,249	278		5,686
Avg. Pay	55,610	65,979	76,772	86,298	88,123	88,976	89,025		79,707
55 to 59	206	648	1,160	1,033	893	939	1,405	435	6,719
Avg. Pay	62,711	66,303	77,731	85,500	89,037	89,374	90,924	93,227	84,255
60 to 64	97	299	708	771	850	790	695	1,025	5,235
Avg. Pay	67,100	74,943	79,302	86,323	89,130	89,829	90,435	93,518	87,307
65 to 69	15	79	172	203	208	268	193	308	1,446
Avg. Pay	90,736	80,024	85,330	87,334	88,601	91,086	91,211	95,047	89,770
70 & up	5	7	29	26	37	38	38	72	252
Avg. Pay	143,719	70,907	87,081	88,437	92,673	90,499	94,464	96,137	92,933
Total	8,462	11,857	11,095	6,479	3,880	3,586	2,609	1,840	49,808
Avg. Pay	50,682	62,535	76,287	86,562	88,898	89,473	90,664	93,808	73,332

Table A-2: Comparative Summary of Active Data

	June 30, 2010	**June 30, 2012**
Average Age	45.0 years	45.2 years
Average Service	13.6 years	13.9 years
Average Pay	$70,978	$73,332

Table A-3: Number of Monthly Retirement Allowances Of Benefit Recipients as of June 30, 2012

Payee Type	Number	Monthly Retirement Allowances
Service Retirement		
A (Life Annuity)	78	$183,708
B (100% Cash Refund)	103	264,259
C (Period Certain and Life)	827	2,708,625
D (Joint and Survivor)	5,654	25,313,028
N (25% Cash Refund)	23,737	94,869,015
Total	**30,399**	**$123,338,635**
Disability Retirement		
A (Life Annuity)	0	$0
B (100% Cash Refund)	0	0
C (Period Certain and Life)	3	4,805
D (Joint and Survivor)	0	0
N (25% Cash Refund)	2	4,178
W (Disability)	257	530,152
Total	**262**	**$539,136**
Beneficiaries	**1,633**	**$3,746,571**
GRAND TOTAL	**32,294**	**$127,624,342**

Investment Rate of Return

Assumed annual rate of 8.50% net of investment expenses.

Rates of Annual Salary Increase

Rates of Annual Salary Increase Assumption		
Years of Service	**2010 – 2011 & 2011 – 2012**	**2012 – 2013 & After**
0	6.50%	7.00%
1	6.50	7.00
2	6.50	7.00
3	6.50	7.00
4	6.50	7.00
5	6.50	7.00
6	6.50	7.00
7	6.50	7.00
8	6.50	7.00
9	6.50	7.00
10	5.50	5.50
11	5.50	5.50
12	5.50	5.50
13	5.50	5.50
14	5.50	5.50
15	4.00	4.00
16	4.00	4.00
17	4.00	4.00
18	4.00	4.00
19	4.00	4.00
20+	3.50	3.75

Active Member Decrement Rates

a. Table below provides a summary of the assumed rates of service retirement.

Annual Rates of Retirement						
Age	**Unreduced**		**Proratable**		**Reduced**	
	Male	Female	Male	Female	Male	Female
50	27.5%	15.0%			2.0%	2.0%
55	38.5%	30.0%			4.5%	6.0%
60	22.0%	20.0%	6.0%	5.4%		
65	36.3%	30.0%	20.0%	13.5%		
70	100.0%	40.0%	35.0%	10.8%		
75	100.0%	40.0%	40.0%	18.0%		
80	100.0%	100.0%	100.0%	100.0%		

b. Table below provides a summary of the assumed rates of mortality while actively employed and disability.

Annual Rates of Death and Disability				
Age	**Pre-Retirement Mortality**		**Disability**	
	Male	Female	Male	Female
20	0.0164%	0.0108%	0.0455%	0.0500%
25	0.0210%	0.0109%	0.0455%	0.0500%
30	0.0268%	0.0140%	0.0455%	0.0410%
35	0.0431%	0.0249%	0.0455%	0.0410%
40	0.0645%	0.0343%	0.0715%	0.0720%
45	0.0790%	0.0527%	0.1625%	0.1200%
50	0.1027%	0.0761%	0.3250%	0.2630%
55	0.1490%	0.1316%	0.7150%	0.4380%
60	0.2911%	0.2675%	1.2805%	0.5000%
64	0.4928%	0.4539%	1.2805%	0.5000%

c. Table below provides a summary of the assumed rates of withdrawal for active members prior to eligibility for retirement.

Annual Rates of Withdrawal					
			10 or more years of service		
Years of Service	Male	Female	Age	Male	Female
0-1	14.00%	12.00%	25	1.20%	3.50%
1-2	8.50	9.00	30	1.20	3.50
2-3	5.50	7.00	35	1.20	3.50
3-4	4.50	6.00	40	1.20	2.30
4-5	3.50	5.50	45	1.26	1.30
5-6	2.50	5.00	50	1.96	1.25
6-7	2.40	4.50	55	2.76	1.60
7-8	2.30	3.50	59	3.00	1.90
8-9	2.20	3.00			
9-10	2.10	2.50			

Post-Retirement Mortality

For healthy retirees and beneficiaries, the RP-2000 Combined Mortality Table projected forward 19 years using scale AA, with a two-year setback for males and females. A separate table of mortality rates is used for disabled retirees. The following are sample rates for the retirees and beneficiaries:

Annual Rates of Death				
	Healthy		Disabled	
Age	Male	Female	Male	Female
50	0.1369%	0.1015%	0.3881%	0.3567%
55	0.1986%	0.1755%	0.7659%	0.6953%
60	0.3881%	0.3567%	1.3671%	1.2224%
65	0.7659%	0.6953%	2.2802%	2.0100%
70	1.3671%	1.2224%	4.1439%	3.2898%
75	2.2802%	2.0100%	7.7020%	5.4696%
80	4.1439%	3.2898%	13.6910%	9.9435%
85	7.7020%	5.4696%	22.0697%	16.4072%

Marriage Assumption

85% of males and 75% of females assumed to be married, with female spouses being 3 years younger than males.

Asset Valuation Method

The actuarial value of assets recognizes a portion of the difference between the actual market value of assets and the expected actuarial value of assets, based on the assumed rate of investment return. The amount recognized each year is 25% of the difference between market value and expected actuarial value.

Actuarial Cost Method

The Entry Age Normal actuarial cost method allocates the plan's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

The unfunded accrued liability is determined by subtracting the actuarial value of assets from the actuarial accrued liability.

Future Cost-of-living Increases

Members who retired prior to September 1, 1992 are assumed to receive an annual Cost-of-Living Adjustment (COLA) of 3.0%. Members who retired on or after September 1, 1992 are assumed to receive an annual Cost-of-Living Adjustment (COLA) of 2.0%.

Administrative and Investment Expenses

The investment return assumption represents the expected return net of all administrative and investment expenses.

Payroll Growth Rate

The total annual payroll of active members is assumed to increase at an annual rate of 3.75%. This rate does not anticipate increases in the number of members.

Changes from Prior Valuation

None.

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

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.

Annual Salary

Annual Salary rate for service as a Connecticut teacher during a school year excluding amounts paid for extra duty assignments, coaching, unused sick time, unused vacation or terminal pay.

Average Annual Salary

Average of Annual Salary received during three years of highest salary.

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 prior to retirement, if the Member pays one-half the cost.

Normal Retirement

Eligibility - Age 60 with 20 years of Credited Service in Connecticut, or 35 years of Credited Service including at least 25 years of service in Connecticut.

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

In addition, amounts derived from the accumulation of 6% contributions made prior to July 1, 1989 and voluntary contributions by the teacher are payable.

Minimum Benefit: Effective January 1, 1999, Public Act 98-251 provides a minimum monthly retirement benefit of $1,200 to teachers who retire under the Normal Retirement provisions and who have completed at least 25 years of full time Connecticut service at retirement.

Early Retirement

Eligibility - 25 years of Credited Service including 20 years of Connecticut service, or age 55 with 20 years of Credited Service including 15 years of Connecticut service.

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. Effective July 1, 1999, the reduction for individuals with 30 or more years of service is 3% for each year by which early retirement precedes the minimum retirement age.

Proratable Retirement

Eligibility - Age 60 with 10 years of Credited Service.

Benefit - 2% less 0.1% for each year less than 20 years of Average Annual Salary times years of Credited Service in Connecticut, plus 1% of Average Annual Salary times years of additional Credited Service time.

Disability Retirement

Eligibility - 5 years of Credited Service in Connecticut if not incurred in the performance of duty and no service requirement if incurred in the performance of duty.

Benefit - 2% of Average Annual Salary times Credited Service to date of disability, but not less than 15% of Average Annual Salary, nor more than 50% of Average Annual Salary. In addition, disability benefit under this plan (without regard to any cost-of-living adjustments) plus any initial award of Social Security benefits and workers' compensation cannot exceed Average Annual Salary.

Termination of Employment

Less than 5 years of Credited Service - Return 6% contributions with interest.

5 or more years of Credited Service - Return 6% contributions with interest and 1% contributions made prior to July 1, 1989 without interest.

10 or more years of Credited Service - Member is 100% vested in the accrued benefit based on Credited Service and Average Annual Salary as of the date of termination of covered employment. Benefits are payable at age 60 and early retirement reductions are based on the number of years service the member would have had if they had continued to work until age 60.

Member may elect return of all contributions plus interest on 6% contributions in lieu of vested benefit.

Pre-Retirement Death Benefits

A lump sum plus one of the following: survivor's benefit, return of all contributions with interest, or 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: For active teachers who die while in service, the family maximum benefit payable to survivors is $1,500 per month. Each minor child is entitled to $300 per month. The surviving spouse's benefit is $300 per month if the member has 12 or less years of service. For each additional year of service, the surviving spouse's monthly benefit is increased $25, up to a maximum of $600.
- Accumulated contributions with interest plus dependent children's benefits as described in the "Survivor's Benefit" paragraph.
- Surviving Spouse's Benefit: An active member who is eligible for immediate retirement and who has named his or her spouse as primary beneficiary will be covered by a 100% Plan D co-participant option in the event of his or her death prior to retirement.

Benefit Options

Normal form: 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 the benefit commencement, the difference is paid to the Member's beneficiary.

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

Amounts payable under the optional forms are determined on an actuarially equivalent basis. Actuarial equivalence is determined using mortality as described in Section F of the report, 8.5% interest, and 2% compound COLA. A unisex mortality blend of 60% male was used for certain benefit forms, and a blend of 80% male was used for co-participant annuity forms.

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.

For teachers who were members of the Teachers' Retirement System before July 1, 2007, and retire on or after September 1, 1992, pension benefit adjustments are made that are consistent with those provided for Social Security benefits on January 1 of the year granted, with a maximum of 6% per annum. If the return on assets in the previous year was less than 8.5%, the maximum increase is 1.5%.

For teachers who were members of the Teachers' Retirement System after July 1, 2007, pension benefit adjustments are made that are consistent with those provided for Social Security benefits on January 1 of the year granted, with a maximum of 5% per annum. If the return on assets in the previous year was less than 11.5%, the maximum increase is 3%, and if the return on the assets in the previous year was less than 8.5%, the maximum increase is 1.0%

Teachers' Required Contribution

Effective July 1, 1992, each teacher is required to contribute 6% of annual salary for the pension benefit.

State Contribution

The State's contribution requirement is determined in accordance with Section 10-183z (which reflects Public Act 79-436 as amended).

Early Retirement Incentive

A local or regional board of education may establish a retirement incentive plan. The plan shall provided for purchase of additional credited service by a board of education and a member of the system who chooses to participate in the plan, of additional credited service for such member and for payment by the board of education of not less than fifty per cent of the entire cost of such total cost. Any such plan shall specify a maximum number of years to be purchased, not to exceed five. Members must have attained age 50 and be eligible for retirement with the additional purchased service. The amount of service purchased cannot exceed the lesser of five years and one-fifth of the member's credited service.

***Actuarial Accrued Liability* -** The difference between the actuarial present value of future benefits payments and the actuarial present value of future normal costs. Also referred to as "accrued liability."

***Actuarial Assumptions* -** Estimates of expected future experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Demographic estimates (rates of mortality, disability, turnover and retirement) are generally based on past experience, modified for projected changes in conditions. Fiscal estimates (salary increases, inflation and real investment return) consist of the underlying rates in an inflation-free environment plus a provision for a long-term average rate of inflation.

***Actuarial Cost Method* -** A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future benefit payments" between future normal cost and actuarial accrued liability.

***Actuarial Present Value* -** The amount of funds currently required to provide a payment or series of payments in the future. It is determined by discounting future payments at predetermined rates of interest and by probabilities of payment. Also referred to as "present value."

***Actuarial Value of Assets* -** The value of current plan assets recognized for valuation purposes.

***Amortization* -** Paying off an interest-discounted amount with periodic payments of interest and principal, as opposed to paying off with a lump sum payment.

***Experience Gain (Loss)* -** A measure of difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

***Normal Cost* -** The annual cost assigned, under the actuarial funding method, to current and subsequent plan years.

***Unfunded Actuarial Accrued Liability* -** The difference between the actuarial accrued liability and actuarial value of assets. Also referred to as "unfunded accrued liability."

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