Connecticut State Teachers' Retirement System Annual Actuarial Valuation

as of June 30, 1998

Gabriel, Roeder, Smith & Company

Kathy Demsey@Budget@OPM.CT
From: "Bill Sudol" <william.sudol@po.state.ct.us>
Sent: Thursday, June 17, 1999 7:52 AM
To: SMTP1@Administration@OPM.CT[<Kathy.Demsey@po.state.ct.us>]
Subject: Re: ...no subject...

Thanks for the info on the B-1. I'll give Brian a call today to push him on getting us the GASB numbers. I'm sorry about the delay. I've asked him an number off times and he has he told me that he's working on it .

<Kathy.Demsey@po.state.ct.us> 06/16/99 09:09AM >>>
Hi Bill - You asked when the B-1 would be coming. It is my understanding that you should be getting it tomorrow. I will let you know if anything changes. Also, I have been asking for almost 5 months for a copy of the GASB supplement to the actuarial valuation. I'm not sure what the problem is but if it is not forthcoming in the next week then the next request for it will come from Secretary Ryan. I always attempt to respond to your requests in a timely manner or let you know why if I can't. I would appreciate the same courtesy. - Kathy

REPORT OF THE JUNE 30, 1998 ACTUARIAL VALUATION
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January 8, 1999

Board of Trustees
Connecticut State Teachers' Retirement System
21 Grand Street
Hartford, Connecticut 06106

Dear Members of the Board:

The results of the annual actuarial valuation of the Connecticut State Teachers' Retirement System as of June 30, 1998 are presented in this report. This valuation is based upon the Teachers' Retirement System benefit provisions, as described in Section C of this report.

The census and financial operations data necessary for an actuarial valuation were furnished by the Retirement System in the Fall of 1998. Preparation of this data requires considerable staff time. The helpful cooperation of the Administrator and his staff in furnishing the data is acknowledged with appreciation.

The actuarial assumptions used in the actuarial valuation are summarized in the Appendix of this report. These assumptions were adopted by the Board in January, 1996 for this actuarial valuation based on the study of 1989-1994 experience.

The valuation was completed using generally accepted actuarial principles and in accordance with standards of practice prescribed by the Actuarial Standards Board. To the best of our knowledge, this report is complete and accurate and the methods and assumptions produced results which are reasonable.

Respectfully submitted,

Brian B. Murphy, F.S.A. Brian F. Dunn, A.S.A.

BBM/alv

COMMENTS

The results shown in this report reflect the following changes since the last actuarial valuation:

- Benefits were increased for the surviving spouse and dependents of a member who dies while still actively employed.

- For members who have become eligible for a retirement benefit, the pre-filing for coverage under a 100% Plan D option prior to retirement has been eliminated. Coverage under a 100% Plan D option is now automatic if the member has satisfied the age and service conditions for a retirement benefit and has designated his or her spouse as primary beneficiary under the plan.

- The minimum monthly benefit for members who have retired or will retire with at least 25 years of service has been increased from $800 to $1,200.

- The Board has adopted new early retirement factors applicable to members who retire on or after July 1, 1999 with at least 30 years of service. The early retirement probabilities used in the valuation have been adjusted in response to this change in the factors.

In each of the two fiscal years since the last valuation, the assets have performed quite well, with rates of return on both a market value basis and an actuarial (smoothed) value basis in excess of the assumed rate of 8.5%.

For this year, the schedules and disclosures needed to comply with Governmental Accounting Standards Board Statements Nos. 25 and No. 27 (GAS 25 and GAS 27) will be contained in a separate supplementary report.

Section A

Financial Principles

FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

Promises Made and To Be Paid For. As each year is completed, the System in effect hands an "IOU" to each member then acquiring a year of service credit. The "IOU" says: "The Connecticut State Teachers' Retirement System (CSTRS) owes you one year's worth of retirement benefits, payments in cash commencing when you qualify for retirement."

The related ***key financial questions*** are:

Which generation of taxpayers contributes the money to cover the IOU?

The present taxpayers, who receive the benefit of the member's present year of service?

Or the future taxpayers, who happen to be in Connecticut at the time the IOU becomes a cash demand?

The financial objective of the CSTRS is that this year's taxpayers contribute the money to cover the IOUs being handed out this year so that ***the employer contribution rate will remain approximately level from generation to generation*** -- our children and our grandchildren will not have to contribute greater percents of pay than we contribute now.

(There are systems which have ***a design for deferring contributions to future taxpayers***, lured by a lower contribution rate now and putting aside the fact that the contribution rate must then relentlessly grow much greater over decades of time -- consume now, and let your children face higher contribution rates after you retire.)

An inevitable byproduct of the level-cost design is the accumulation of reserve assets for decades and the income produced when the assets are invested. ***Investment income*** becomes the ***3rd and largest contributor*** for benefits to employees, and is interlocked with the contribution amounts required from employees and employers.

Translated to actuarial terminology, this level-cost objective means that the contribution rates must total at least the following:

> Normal Cost (the cost of members' service being rendered this year)
> ... plus ...
> Interest on Unfunded Actuarial Accrued Liabilities (unfunded accrued liabilities are the difference between (i) liabilities for service already rendered and (ii) the accrued assets of the plan).

Computing Contributions to Support System Benefits. From a given schedule of benefits and from the employee data and asset data furnished, the actuary determines the contribution rates to support the benefits, by means of ***an actuarial valuation***.

An actuarial valuation has a number of ingredients such as: the rate of investment income which plan assets will earn; the rates of withdrawal of active members who leave covered employment before qualifying for any monthly benefit; the rates of mortality; the rates of disability; the rates of pay increases; and the assumed age or ages at actual retirement.

In an actuarial valuation, assumptions must be made as to what the above rates will be, for the next year and for decades in the future. Only the subsequent actual experience of the System can indicate the degree of accuracy of the assumptions.

Reconciling Differences Between Assumed Experience and Actual Experience. Once actual experience has occurred and been observed, it will not coincide exactly with assumed experience, regardless of the accuracy of the various financial assumptions or the skill of the actuary and the precision of the calculations made. The System copes with these continually changing differences by having annual actuarial valuations. Each actuarial valuation is a complete recalculation of assumed future experience, taking into account all past differences between assumed and actual experience. The result is continual adjustments in financial position.

THE ACTUARIAL VALUATION PROCESS

The financing diagram on the next page shows the relationship between the two fundamentally different philosophies of paying for retirement benefits: the method where contributions match cash benefit payments (or barely exceed cash benefit payments, as in the Federal Social Security program), and is thus an ***increasing contribution method***; and the ***level contribution method*** which equalizes contributions between the generations.

The actuarial valuation is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

A. ***Census Data***, furnished by the plan administrator
   Retired lives now receiving benefits
   Former employees with vested benefits not yet payable
   Active employees

B. + ***Asset data*** (cash and investments), furnished by the plan administrator

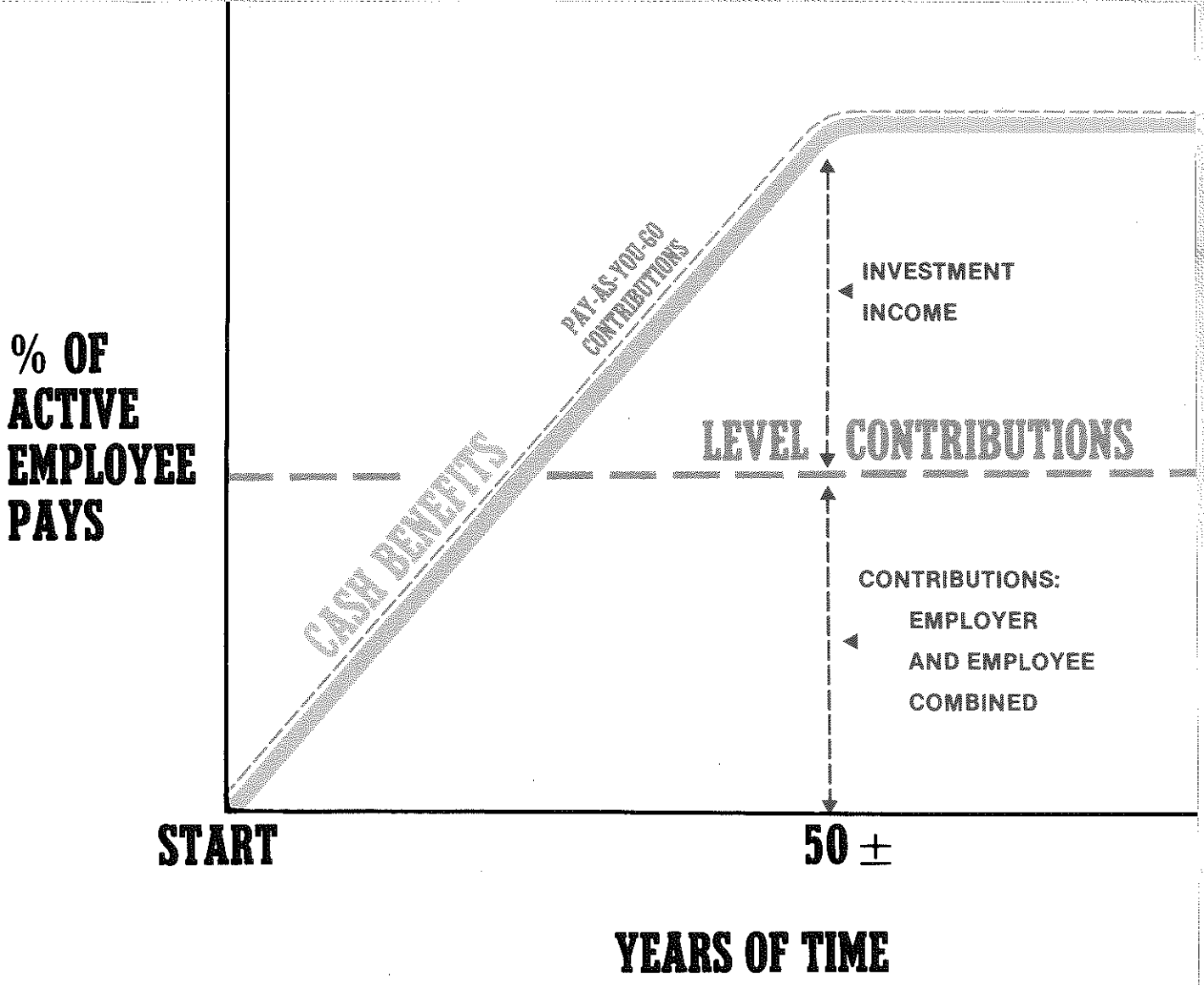
C. + **Benefit provisions** that establish eligibility and amounts of payments to members

D. + ***Assumptions concerning future financial experiences in various risk areas***, which assumptions are established by the Board of Trustees after consulting with the actuary.

E. + ***The funding method*** for employer contributions (the long-term planned pattern for employer contributions)

F. + ***Mathematically combining the assumptions, the funding method, and the data***

G. = Determination of:
   Plan financial position, and/or
   New Employer Contribution Rate



CASH BENEFITS LINE. **This relentlessly increasing line is the fundamental reality of retirement plan financing. It happens each time a new benefit is added for future retirements (and happens regardless of the design for contributing for benefits).**

LEVEL CONTRIBUTION LINE. **Determining the level contribution line requires detailed assumptions concerning a variety of experiences in future decades, including:**

Economic Risk Areas

- **Rates of investment return**
- **Rates of pay increase**
- **Changes in active member group size**

Non-Economic Risk Areas

- **Ages at actual retirement**
- **Rates of mortality**
- **Rates of withdrawal of active members (turnover)**
- **Rates of disability**

Section B

Results of Valuation

STATE CONTRIBUTION RATE COMPUTED AS OF JUNE 30, 1998 FOR THE TWO-YEAR PERIOD BEGINNING JULY 1, 1999

Computed Contributions for	Percents of Active Member Payroll
Normal Cost	
Age and service annuities	7.56 %
Separation benefits	1.47 %
Disability annuities	0.25 %
Death-in-service annuities	0.15 %
Total	9.43 %
Member Contributions	6.00 %
Employer Normal Cost	3.43 %
Unfunded Actuarial Accrued Liabilities:	
Plan in effect 6/30/91 (34 years)	10.21 %
Public Act 82-91 (15 years)	0.12 %
Public Act 87-381 (20 years)	0.01 %
Public Act 92-205 (25 years)	(4.30)%
Public Act 98-251 (30 years)	0.02 %
Total	6.06 %
State Contribution Rate	**9.49 %**

Based on a projected member payroll of $2,534,500,000 for the 1999-2000 Fiscal Year, the computed State contribution for that Fiscal Year is $240,524,050. Based on a projected member payroll of $2,661,200,000 for the 2000-2001 Fiscal Year, the computed State contribution for that Fiscal Year is $252,547,880.

The length of an amortization period is a matter of judgment, not a matter of solving an algebraic equation. No one amortization period is "correct" – there is a range of reasonable judgment. As specified in Chapter 167a, Section 10-183z of the Connecticut General Statutes, the Unfunded Actuarial Accrued Liability (UAAL) resulting from the plan provisions in effect as of June 30, 1991 is to be amortized over a 40-year period, while subsequent changes in the UAAL are to be amortized over 30 years.

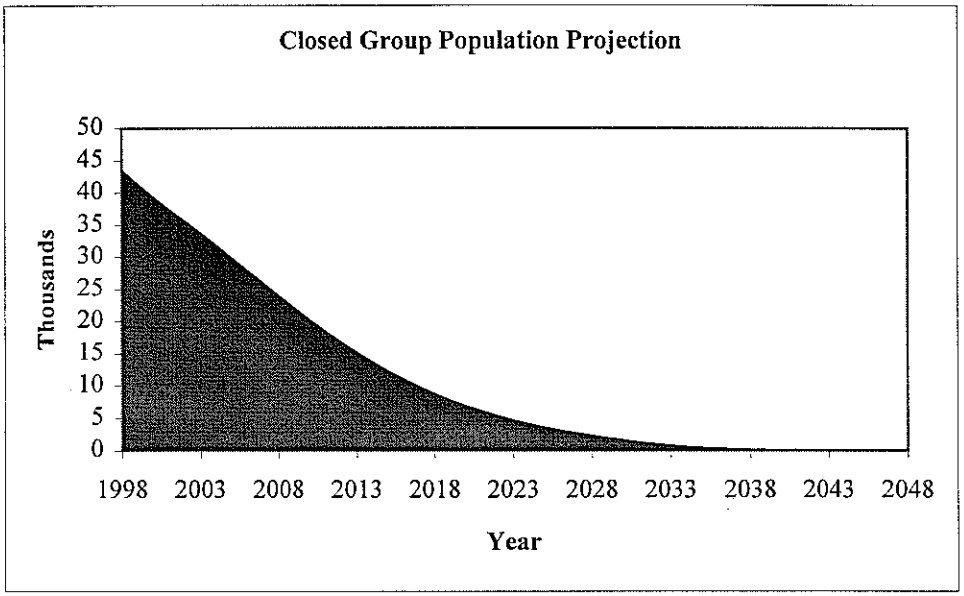
COMPUTED ACTUARIAL LIABILITIES
AS OF JUNE 30, 1998

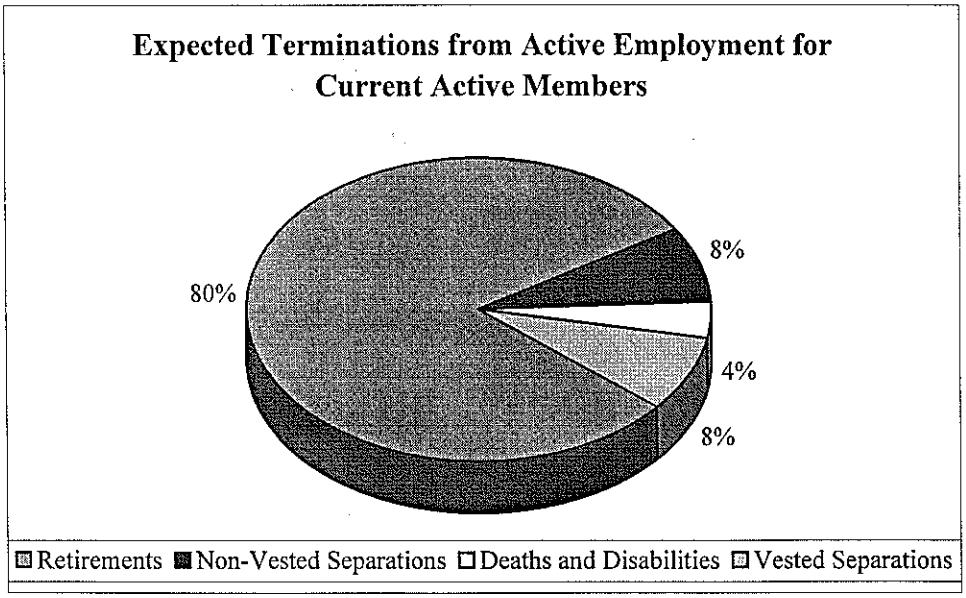
Actuarial Present Value of	(1) Total Present Value	Entry Age Actuarial Cost Method (2) Portion Covered By Future Normal Cost Contributions	Entry Age Actuarial Cost Method (3) Actuarial Accrued Liabilities (1) - (2)
Age and service allowances based on total service likely to be rendered by present active members	$7,461,648,091	$1,573,304,445	$5,888,343,646
Separation benefits (refunds of contributions, and deferred allowances) likely to be paid present active members	237,764,180	303,687,863	(65,923,683)
Disability benefits likely to be paid present active members	77,784,474	52,078,305	25,706,169
Death in service benefits likely to be paid on behalf of present active members	103,471,219	30,354,136	73,117,083
Voluntary and 1% contribution account	269,699,433	0	269,699,433
Benefits payable to present retirees and beneficiaries	4,679,864,579	0	4,679,864,579
Deferred benefits payable to members who terminated with vested rights	99,276,433	0	99,276,433
Future Cost of Living Adjustments to be paid from the Excess Earnings Account	1,118,495,578	0	1,118,495,578
Total	$14,048,003,987	$1,959,424,749	$12,088,579,238
Applicable assets including EEA balance			8,839,548,678
Unfunded actuarial accrued liability			$3,249,030,560

COMPUTED ACTUARIAL LIABILITIES
AS OF JUNE 30, 1998

Various Acts have provided benefit changes for groups of plan members. These liabilities are included in the unfunded actuarial accrued liabilities shown on the previous page, and the resulting added contribution is included in the employer contribution rate shown in this report. At June 30, 1998, the remaining unfunded actuarial accrued liability was $3,249,030,560.

EXPECTED DEVELOPMENT OF PRESENT POPULATION
JUNE 30, 1998





The charts show the expected future development of the present population in simplified terms. The retirement system presently covers 43,452 active members. Eventually, 8% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Nearly 88% of the present population is expected to receive monthly retirement benefits either by retiring directly from active service, or by retiring from vested deferred status. 4% of the present population is expected to become eligible for death-in-service or disability benefits. Within 11 years, over half of the covered membership is expected to consist of new hires.

SHORT CONDITION TEST

The CSTRS funding objective is to meet long term benefit promises through contributions that remain approximately level from year to year as a percent of member payroll. If the contributions to the System are level in concept and soundly executed, the System will ***pay all promised benefits when due -- the ultimate test of financial soundness***. Testing for level contribution rates is ***the*** long term test.

A short condition test is one means of checking a system's progress under its funding program. In a short condition test, the plan's present assets (cash and investments) are compared with: 1) Member contributions on deposit; 2) The liabilities for future benefits to present retired lives; 3) The liabilities for service already rendered by members. In a system that has been following the discipline of level percent of payroll financing, the liabilities for member contributions on deposit (liability 1) and the liabilities for future benefits to present retired lives (liability 2) will be fully covered by present assets (except in rare circumstances). In addition, the liabilities for service already rendered by members (liability 3) will be partially covered by the remainder of present assets. The larger the funded portion of liability 3, the stronger the condition of the system. Liability 3 being fully funded is unusual.

	Entry Age Accrued Liability				Portion of Present Values Covered by Present Assets			
Val. Date June 30	(1) Member Contr.	(2) Retirees and Benef.	(3) Active and Inactive Members (Employer Financed Portion)	Present Valuation Assets@	(1)	(2)	(3)	Total
	($ in Millions)							
1992#	$1,561	$3,463	$2,254	$4,848	100%	95%	0%	67%
1993								
1994	1,900	3,825	2,498	5,602	100%	97%	0%	68%
1995								
1996*	2,277	4,099	3,251	6,648	100%	100%	8%	69%
1997								
1998#	2,882	4,680	3,408	7,721	100%	100%	5%	70%

\# *After change in benefit provisions.*
@ *Valuation assets do not include the Excess Earnings Account balance.*
* *After changes in actuarial assumptions and methods.*

Funded

Note: No actuarial valuations were performed as of June 30, 1993, June 30, 1995 and June 30, 1997.

Section C

Summary of Benefits

SUMMARY OF PROVISIONS
JUNE 30, 1998

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, 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 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. The Teachers' Retirement Board has adopted new early retirement factors that will apply effective July 1, 1999 to any member who retires on or after that date with at least 30 years of service. The new factors are 3% per year 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 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: 2% times Credited Service to date of disability times Average Annual Salary, but not less than 15% times Average Annual Salary, nor more than 50% of Average Annual Salary. In addition, in no case will a disability benefit under this plan (without regard to any cost of living adjustments) plus any initial award of Social Security benefits and workers' compensation exceed the Average Annual Salary.

9. Termination of Employment

With less than 5 years of Credited Service: Return of 6% contributions with interest.

With 5 or more years of Credited Service: Return of 6% 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 6% 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: For active teachers who die while in service the family maximum benefit payable to survivors has been increased from $600 to $1,500 per month. Each minor child is entitled to $300 per month. The surviving spouse's benefit will be $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: the 50% co-participant option plus dependent children's benefits as described in the "Survivor Benefit" paragraph.

- Automatic 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 automatically covered by a 100% Plan D co-participant option in the event of his or her death prior to retirement.

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 the Member's 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 6% of annual salary for the pension benefit. An additional 1% of annual salary is contributed for health insurance of 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 10-183z (which reflects Public Act 79-436 as amended).

SAMPLE BENEFIT COMPUTATIONS FOR A MEMBER RETIRING JUNE 30, 1998

The data for the sample member is shown below.

A.	$40,000	Average Annual Salary
B.	32	Total Credited Service (all in Connecticut for the purpose of this example)
C.	60	Age of Retiree
D.	55	Age of Spouse
E.	100%	Percentage of Retirement Allowance to Continue to Spouse after Retiree's Death (Retiree Chooses this Percentage)

The computations that would be made for this case are:

		Annual Amount
F.	Formula Benefit: 2% x A x B	$25,600
G.	Adjustment for Line E election (1 - .828) x $25,600	4,403
H.	Net Annual Benefit Payable	$21,197

Subject to the availability of funds in the Excess Earnings Account, this benefit could be increased by a cost of living adjustment (COLA). The amount of the COLA in a given year depends on the Teachers' Retirement Fund investment returns and the rate of increases in Social Security benefits.

Section D

Financial Information

ASSET VALUATION METHOD

An essential step in measuring a retirement system's financial position is comparing valuation assets with computed actuarial accrued liabilities. Valuation assets are the current plan assets recognized for valuation purposes. They may be based on:

- Original cost
- Amortized cost (= book)
- Market
- Smoothing techniques

In the very long term, consistent use of any of the methods will produce the same result. However, in the short term, variations in results are often significant. ***The timing of recognition of investment return is what distinguishes one asset valuation method from another.***

The key to pinning down "investment return" is the treatment given to capital value changes during the valuation period. By any definition, investment return dollars will include ordinary investment income. But when should capital value changes be recognized?

A rate of investment return is determined by dividing investment return dollars by "dollars invested". "Dollars invested" means the system's assets, including the cumulative amount of "investment return dollars" recorded in the past (ordinary income plus capital value changes).

Cost Basis. Investment return is the total of: ordinary income; plus capital gains (and losses) realized on the sales, if any, of investments during the period.

Investment return can be greatly affected by whether there is a lot of sales activity or little sales activity. The type of sales activity is also significant; for example, is there a pattern of selling only when a gain can be realized, and not selling if a loss would be realized? The overall capital value changes recorded can differ substantially from overall market value changes.

This potential for distortion of recorded investment results, for reasons outside of investment market activity, is a weakness of the cost basis. A related criticism of cost basis is that an investment has to be sold in order to have market value change recorded.

Market Basis. Since the cost value of a security is simply its market value at the time of purchase, why not keep up to date by using current market value? Market price on any date is usually established by less than 5% (and often less than 1%) of the security being traded. Many of the traders are influenced by such non-investment considerations as tax minimization (recording a gain or loss), accounting statements (making a financial statement look more impressive), and meeting prescribed standards for portfolio composition (legal and/or self-imposed standards). Irrational human behavior is also present in the market place, in varying amounts from day to day, but always defying on-the-spot measurement. An issuer of a security can be operating in a stable manner (sales, earnings, dividends) and yet have its stock price go up 10+% in one year and down 10+% the year after. Short-term factors are operating rather than a change in long-term value. Over a period of years the ups and downs offset each other to some extent, but important judgments are made year by year (and sometimes more frequently).

Market price on one day is not a reliable measure of long-term value. Further, use of pure market in actuarial valuations will introduce volatility that is generally inconsistent with funding objectives.

Better Basis. The long-term value of assets is not knowable today. Recognition of this truth leads to the search for a good approximation, because a value is needed for measuring funding progress and/or determining a new contribution rate.

There are many different asset valuation methods in use and they vary widely in difficulty. A method requiring laborious work (such as a method requiring separate valuation of each security in a portfolio) is usually not justified because the quality of the result is not correlated with the hours spent.

The method used in CSTRS is shown on the following page. It is designed to filter out the effect of timing of security sales on the asset value recognized. It does this by phasing in differences between actual investment income (market value basis) and expected investment income (funding value basis) over a 4 year period.

DEVELOPMENT OF FUNDING VALUE OF ASSETS
(4 YEAR SMOOTHING)

Valuation Date June 30	1998	1999	2000	2001
A. Funding Value Beginning of Year	$7,786,100,258			
B. Market Value End of Year	9,986,401,443			
C. Market Value Beginning of Year	8,679,187,861			
D. Non-Investment Net Cash Flow	(188,427,752)			
E. Investment Return				
E1. Market Total: B-C-D	1,495,641,334			
E2. Assumed Rate	8.50%			
E3. Amount for Immediate Recognition	653,810,342			
E4. Amount for Phased In Recognition	841,830,992			
F. Phased-In Recognition of Investment Return				
F1. Current Year :0.25 x E4	210,457,748	$ 0	$ 0	$ 0
F2. First Prior Year	207,005,604	210,457,748	0	0
F3. Second Prior Year	101,468,315	207,005,604	210,457,748	0
F4. Third Prior Year	69,134,163	101,468,315	207,005,604	210,457,746
F5. Total Recognized Investment Gain	588,065,830	518,931,667	417,463,352	210,457,746
G. Funding Value End of Year: A+D+E3+F5	8,839,548,678			
H. Difference Between Market & Funding Values	1,146,852,765	627,921,098	210,457,746	0
I. Recognized Rate of Return	16.15%			

The Funding Value of Assets recognizes assumed investment return (line E3) fully each year. Differences between actual and assumed investment return (Line E4) are phased in over a closed 4 year period. During periods when investment performance exceeds the assumed rate, Funding Value of Assets will tend to be less than market value. During periods when investment performance is less than the assumed rate, Funding Value of Assets will tend to be greater than market value. If assumed rates are exactly realized for 3 consecutive years, funding value will become equal to market value.

FUNDING VALUE OF ASSETS - COMPARATIVE STATEMENT

Valuation Date June 30	1995	1996	1997	1998
A. Funding Value Beginning of Year	$6,048,414,944	$6,497,192,923	$7,054,928,987	$7,786,100,258
B. Market Value End of Year	6,643,956,463	7,440,286,292	8,679,187,861	9,986,401,443
C. Market Value Beginning of Year	5,985,605,850	6,643,956,463	7,440,286,292	8,679,187,861
D. Non-Investment Net Cash Flow	(126,907,731)	(155,208,468)	(181,093,344)	(188,427,752)
E. Investment Return				
E1. Market Total: B-C-D	785,258,344	951,538,297	1,419,994,913	1,495,641,334
E2. Assumed Rate	8.50%	8.50%	8.50%	8.50%
E3. Amount for Immediate Recognition	508,721,692	545,665,039	591,972,497	653,810,342
E4. Amount for Phased In Recognition	276,536,652	405,873,258	828,022,416	841,830,992
F. Phased-In Recognition of Investment Return				
F1. Current Year:0.25xE4	69,134,163	101,468,315	207,005,604	210,457,748
F2. First Prior Year	(57,315,964)	69,134,163	101,468,315	207,005,604
F3. Second Prior Year	53,992,979	(57,315,964)	69,134,163	101,468,315
F4. Third Prior Year	1,152,840	53,992,979	(57,315,964)	69,134,163
F5. Total Recognized Investment Gain	66,964,018	167,279,493	320,292,118	588,065,830
G. Funding Value End of Year: A+D+E3+F5	6,497,192,923	7,054,928,987	7,786,100,258	8,839,548,678
H. Difference Between Market & Funding Values	146,763,540	385,357,305	893,087,603	1,146,852,765
I. Recognized Rate of Return	9.62%	11.11%	13.10%	16.15%

on an actuarial basis

The market value of the assets of the Retirement System, as of June 30, 1998, was $9,986,401,443.

Assets	June 30, 1998
Market value of plan assets	$9,986,401,443
Market value adjustment	(1,146,852,765)
Funding value of assets prior to adjustment for Excess Earnings Account	$8,839,548,678
Excess Earnings Account balance	(1,118,495,578)
Net funding value of plan assets	$7,721,053,100

In financing the Retirement System actuarial accrued liabilities, the applicable assets of $7,721,053,100 were applied as follows:

	Assets Applied to		
Account	Retiree and Beneficiary Liabilities	Active and Inactive Member Liabilities	Totals
Computed Accrued Liabilities	$4,679,864,579	$6,290,219,081	$10,970,083,660
Valuation Assets	$4,679,864,579	3,041,188,521	7,721,053,100
Unfunded Accrued Liabilities	$ 0	$3,249,030,560	$3,249,030,560

Assets during the year developed as follows:

MARKET VALUE RECONCILIATION OF ASSETS

	Reconciliation as of June 30, 1998
Net Market Value July 1, 1997	$8,679,187,861
Additions	
Employer Contributions	179,365,000
Employee Contributions	155,242,385
Change in Net Appreciation	647,505,343
Interest and Dividends	337,372,813
Gain on Sale of Securities	510,763,178
Total Additions	$1,830,248,719
Deductions	
Benefits	511,011,557
Refunds of Contributions	12,023,580
Total Deductions	$ 523,035,137
Net Increase	1,307,213,582
Net Market Value June 30,1998	$9,986,401,443

Basic Series

Year-by-Year Total Returns (1926-1997)

For a type of investment,
Red means a REAL Return less than 3%
[(Total - Inflation)<3%]

For Inflation,
RED means a purchasing power loss

Year	Large Company Stocks	Small Company Stocks	Long-Term Corporate Bonds	Long-Term Government Bonds	Intermediate Term Government Bonds	U.S. Treasury Bills	Inflation
1926	11.62	0.28	7.37	7.77	5.38	3.27	-1.49
1927	37.49	22.10	7.44	8.93	4.52	3.12	-2.08
1928	43.61	39.69	2.84	0.10	0.92	3.56	-0.97
1929	-8.42	-51.36	3.27	1.17	6.01	4.75	0.20
1930	-24.90	-38.15	7.98	4.66	6.72	2.41	-6.03
1931	-43.34	-49.75	-1.85	-5.31	-2.32	1.07	-9.52
1932	-8.19	-5.39	10.32	16.84	8.81	0.96	-10.30
1933	53.99	142.87	10.38	-0.07	1.83	0.30	0.51
1934	-1.44	24.22	13.84	10.03	9.00	0.16	2.03
1935	47.67	40.19	9.61	4.98	7.01	0.17	2.99
1936	33.92	64.80	6.74	7.52	3.06	0.18	1.21
1937	-35.03	-58.01	2.75	0.23	1.56	0.31	3.10
1938	31.12	32.80	6.13	5.53	6.23	-0.02	-2.78
1939	-0.41	0.35	3.97	5.94	4.52	0.02	-0.48
1940	-9.78	-5.16	3.39	6.09	2.96	0.00	0.96
1941	-11.59	-9.00	2.73	0.93	0.50	0.06	9.72
1942	20.34	44.51	2.60	3.22	1.94	0.27	9.29
1943	25.90	88.37	2.83	2.08	2.81	0.35	3.16
1944	19.75	53.72	4.73	2.81	1.80	0.33	2.11
1945	36.44	73.61	4.08	10.73	2.22	0.33	2.25
1946	-8.07	-11.63	1.72	-0.10	1.00	0.35	18.16
1947	5.71	0.92	-2.34	-2.62	0.91	0.50	9.01
1948	5.50	-2.11	4.14	3.40	1.85	0.81	2.71
1949	18.79	19.75	3.31	6.45	2.32	1.10	-1.80
1950	31.71	38.75	2.12	0.06	0.70	1.20	5.79
1951	24.02	7.80	-2.69	-3.93	0.36	1.49	5.87
1952	18.37	3.03	3.52	1.16	1.63	1.66	0.88
1953	-0.99	-6.49	3.41	3.64	3.23	1.82	0.62
1954	52.62	60.58	5.39	7.19	2.68	0.86	-0.50
1955	31.56	20.44	0.48	-1.29	-0.65	1.57	0.37
1956	6.56	4.28	-6.81	-5.59	-0.42	2.46	2.86
1957	-10.78	-14.57	8.71	7.46	7.84	3.14	3.02
1958	43.36	64.89	-2.22	-6.09	-1.29	1.54	1.76
1959	11.96	16.40	-0.97	-2.26	-0.39	2.95	1.50
1960	0.47	-3.29	9.07	13.76	11.76	2.66	1.48
1961	26.89	32.09	4.82	0.97	1.85	2.13	0.67
1962	-8.73	-11.90	7.95	6.89	5.56	2.73	1.22
1963	22.80	23.57	2.19	1.21	1.64	3.12	1.65
1964	16.48	23.52	4.77	3.51	4.04	3.54	1.19
1965	12.45	41.75	-0.46	0.71	1.02	3.93	1.92
1966	-10.06	-7.01	0.20	3.65	4.69	4.76	3.35
1967	23.98	83.57	-4.95	-9.18	1.01	4.21	3.04
1968	11.06	35.97	2.57	-0.26	4.54	5.21	4.72
1969	-8.50	-25.05	-8.09	-5.07	-0.74	6.58	6.11
1970	4.01	-17.43	18.37	12.11	16.86	6.52	5.49
1971	14.31	16.50	11.01	13.23	8.72	4.39	3.36
1972	18.98	4.43	7.26	5.69	5.16	3.84	3.41
1973	-14.66	-30.90	1.14	-1.11	4.61	6.93	8.80
1974	-26.47	-19.95	-3.06	4.35	5.69	8.00	12.20
1975	37.20	52.82	14.64	9.20	7.83	5.80	7.01
1976	23.84	57.38	18.65	16.75	12.87	5.08	4.81
1977	-7.18	25.38	1.71	-0.69	1.41	5.12	6.77
1978	6.56	23.46	-0.07	-1.18	3.49	7.18	9.03
1979	18.44	43.46	-4.18	-1.23	4.09	10.38	13.31
1980	32.42	39.88	-2.62	-3.95	3.91	11.24	12.40
1981	-4.91	13.88	-0.96	1.86	9.45	14.71	8.94
1982	21.41	28.01	43.79	40.36	29.10	10.54	3.87
1983	22.51	39.67	4.70	0.65	7.41	8.80	3.80
1984	6.27	-6.67	16.39	15.48	14.02	9.85	3.95
1985	32.16	24.66	30.09	30.97	20.33	7.72	3.77
1986	18.47	6.85	19.85	24.53	15.14	6.16	1.13
1987	5.23	-9.30	-0.27	-2.71	2.90	5.47	4.41
1988	16.81	22.87	10.70	9.67	6.10	6.35	4.42
1989	31.49	10.18	16.23	18.11	13.29	8.37	4.65
1990	-3.17	-21.56	6.78	6.18	9.73	7.81	6.11
1991	30.55	44.63	19.89	19.30	15.46	5.60	3.06
1992	7.67	23.35	9.39	8.05	7.19	3.51	2.90
1993	9.99	20.96	13.19	18.24	11.24	2.90	2.75
1994	1.31	3.11	-5.76	-7.77	-5.14	3.90	2.67
1995	37.43	34.46	27.20	31.67	16.80	5.60	2.54
1996	23.07	17.62	1.40	-0.93	2.10	5.21	3.32
1997	33.36	22.78	12.95	15.85	8.38	5.26	1.70

GABRIEL, ROEDER, SMITH & COMPANY from SBBI 1998 Yearbook

HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

Calendar Year Period	Gross Market Returns				Price Inflation (CPI)	National Average Earnings (NAE)	Sample Balanced Fund*	
	Bonds (Long)		Cash Equiv. (T Bills)	Stocks (S&P 500)			Total (I)	Spread: I - NAE - e
	U.S. Treasury	Corp. (S&P AA)						
1960-69	1.4%	1.7%	3.9%	7.8%	2.5%	4.3%	5.2%	0.4%
1970-79	5.5	6.2	6.3	5.9	7.4	6.9	6.3	(1.1)
1980-89	12.6	13.0	8.9	17.5	5.1	5.8	15.1	8.8
1990-97	10.7	10.2	5.0	16.6	3.1	3.6	13.2	9.1
Last 38 Years	7.3%	7.6%	6.0%	11.6%	4.6%	5.2%	9.7%	**4.0%**

* Sample Balanced Fund	
Equities	50%
Bonds - Government	20
- Corporate	20
Cash Equivalents	10
	100%
Fund Expenses (e)	0.5%

Section E

Covered Member Data

TOTAL ACTIVE MEMBERS IN VALUATION JUNE 30, 1998
BY ATTAINED AGE AND YEARS OF SERVICE

Attained Age	Years of Service to Valuation Date							Totals	
	0-4	5-9	10-14	15-19	20-24	25-29	30 Plus	No.	Valuation Payroll
15-19	1							1	$ 28,851
20-24	293	1						294	8,652,053
25-29	2,943	436						3,379	114,668,460
30-34	1,757	1,487	345					3,589	139,414,461
35-39	929	876	1,465	247				3,517	159,503,847
40-44	1,014	939	1,223	1,456	607			5,239	265,116,946
45-49	1,040	1,199	1,510	1,174	2,625	1,556	1	9,105	503,286,621
50-54	539	766	1,472	1,123	1,237	3,843	1,349	10,329	612,989,614
55-59	162	246	621	694	737	994	2,286	5,740	354,353,475
60	15	20	51	66	95	116	231	594	36,994,801
61	9	14	38	49	59	99	138	406	25,449,024
62	5	13	34	48	44	65	121	330	20,500,922
63	6	9	18	32	50	52	91	258	15,675,626
64	1	9	18	25	33	37	69	192	11,921,250
65		4	12	15	21	28	56	136	8,771,253
66	1	3	11	12	17	22	27	93	5,959,094
67		4	10	9	12	15	25	75	4,497,871
68			7	4	13	18	25	67	4,401,582
69		2	2	10	5	4	16	39	2,389,972
70 & Over	1	2	5	6	8	14	33	69	4,305,689
Totals	**8,716**	**6,030**	**6,842**	**4,970**	**5,563**	**6,863**	**4,468**	**43,452**	**$2,298,881,412**

While not used in the financial computations, the following group averages are computed and shown because of their general interest.

Age:	45.9	years
Service:	15.9	years
Annual Pay:	$52,906	

MALE, FEMALE, AND TOTAL MEMBERS IN VALUATION JUNE 30, 1998
BY YEARS OF SERVICE

Service Years	Active Member Count			Active Member Pays	
	Males	Females	Total	Total	Average
0	69	216	285	$ 9,196,624	$32,269
1	626	1,849	2,475	78,975,278	31,909
2	495	1,660	2,155	75,807,413	35,177
3	426	1,587	2,013	74,008,764	36,765
4	387	1,401	1,788	68,987,236	38,583
5	313	1,167	1,480	60,716,656	41,025
6	239	1,127	1,366	58,923,394	43,136
7	129	750	879	39,569,946	45,017
8	177	937	1,114	53,186,293	47,744
9	211	980	1,191	59,095,715	49,619
10	224	1,177	1,401	71,548,280	51,069
11	261	1,262	1,523	80,951,539	53,153
12	221	1,207	1,428	77,215,206	54,072
13	262	1,140	1,402	76,780,305	54,765
14	201	887	1,088	60,425,363	55,538
15 & Up	7,557	14,307	21,864	1,353,493,400	61,905
Totals	**11,798**	**31,654**	**43,452**	**$2,298,881,412**	**$52,906**

FORMER ACTIVE MEMBERS AND BENEFICIARIES IN PAY STATUS BY PLAN CODE

Number in Each Plan Code

Plan	Retirees	Beneficiaries*	Disabled	Total
A (Life Annuity)	808	0	18	826
B (100% Cash Refund)	1,194	0	12	1,206
C (Period Certain and Life)	1,508	287	9	1,804
D (Joint and Survivor)	2,296	452	0	2,748
N (25% Cash Refund)	11,688	21	15	11,724
S (Survivor)	0	520	0	520
W (Disability)	0	5	302	307
Total	**17,494**	**1,285**	**356**	**19,135**

Monthly Benefits Paid in Each Plan Code

Plan	Retirees	Beneficiaries*	Disabled	Total
A (Life Annuity)	$ 1,131,934	$ 0	$ 13,764	$ 1,145,698
B (100% Cash Refund)	1,845,749	0	9,494	1,855,243
C (Period Certain and Life)	2,906,538	509,369	7,708	3,423,615
D (Joint and Survivor)	6,412,694	692,589	0	7,105,283
N (25% Cash Refund)	27,690,523	21,930	14,197	27,726,650
S (Survivor)	0	140,000	0	140,000
W (Disability)	0	3,339	573,769	577,108
Total	**$39,987,438**	**$1,367,227**	**$618,932**	**$41,973,597**

* *Beneficiaries category includes 520 Surviving Spouses and Dependents combined.*

RETIREES, BENEFICIARIES, SURVIVING SPOUSES AND DEPENDENTS BY YEAR BENEFITS COMMENCED

Year	Number	Annuity	Pension	Voluntary	Total	Average
1998	118	$ 0	$ 234,213	$ 5,483	$ 239,696	$2,031
1997	1,171	0	3,170,502	61,307	3,231,809	2,760
1996	1,046	0	2,838,919	64,951	2,903,870	2,776
1995	1,097	0	2,967,615	61,801	3,029,416	2,762
1994	1,090	0	2,988,467	70,661	3,059,128	2,807
1993	636	0	1,499,719	35,697	1,535,416	2,414
1992	2,025	0	5,817,821	130,314	5,948,135	2,937
1991	998	0	2,581,905	61,267	2,643,172	2,648
1990	992	0	2,387,673	59,812	2,447,485	2,467
1989	923	0	2,135,203	65,211	2,200,414	2,384
1988	655	265,122	1,070,548	39,278	1,374,948	2,099
1987	639	242,647	993,810	37,259	1,273,716	1,993
1986	694	244,294	1,068,921	35,624	1,348,839	1,944
1985	690	219,550	994,809	33,467	1,247,826	1,808
1984	638	180,538	895,103	20,188	1,095,829	1,718
1983	571	146,226	768,759	16,835	931,820	1,632
1982	577	132,072	749,497	12,965	894,534	1,550
1981	523	108,796	637,230	12,895	758,921	1,451
1980	448	64,093	583,722	8,971	656,786	1,466
1979	460	63,891	635,315	11,367	710,573	1,545
1978	392	46,689	493,282	10,499	550,470	1,404
1977	379	42,076	506,295	8,664	557,035	1,470
1976	342	37,861	484,678	5,367	527,906	1,544
1975	287	27,499	409,853	3,709	441,061	1,537
1974	269	22,465	350,755	6,568	379,788	1,412
1973	274	22,922	384,633	4,441	411,996	1,504
1972	276	21,859	363,307	5,021	390,187	1,414
1971	186	14,481	245,555	3,454	263,490	1,417
1970	153	10,395	188,026	4,051	202,472	1,323
1969	109	6,312	124,925	4,262	135,499	1,243
1968	126	7,215	148,756	4,031	160,002	1,270
1967	68	3,788	84,976	2,231	90,995	1,338
1966	55	2,623	60,805	2,701	66,129	1,202
1965	62	3,051	74,359	1,876	79,286	1,279
1964	23	1,089	29,977	337	31,403	1,365
1963	30	1,178	32,611	941	34,730	1,158
1962	26	886	27,757	640	29,283	1,126
1961	30	992	31,444	918	33,354	1,112
1960	19	578	19,974	1,202	21,754	1,145
1959	10	237	7,856	900	8,993	899
1958	6	176	5,484	300	5,960	993
1957	7	187	5,857	0	6,044	863
1956	4	120	4,467	0	4,587	1,147
1955	2	62	2,224	0	2,286	1,143
1954	1	34	1,106	0	1,140	1,140
1953	3	69	2,266	0	2,335	778
1952	2	30	1,028	0	1,058	529
1951	0	0	0	0	0	0
1950	0	0	0	0	0	0
1949	0	0	0	0	0	0
1948	3	19	2,002	0	2,021	674
Total	**19,135**	**$1,942,122**	**$39,114,009**	**$917,466**	**$41,973,597**	**$2,194**

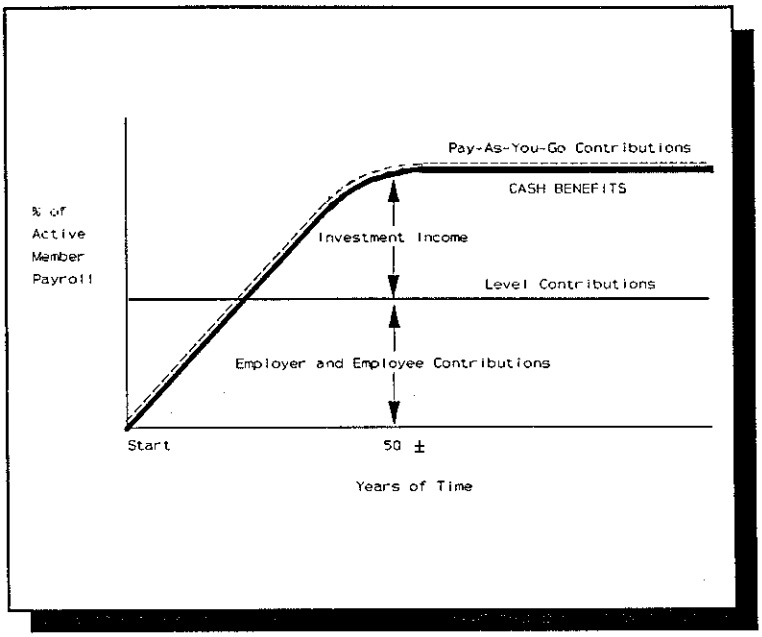
Section F

Appendix

SELECTION OF ASSUMPTIONS USED IN ACTUARIAL VALUATIONS

Economic Assumptions

Investment return
Pay increases to individual employees:
the portion for economic changes
Active member group size and
total payroll growth



Demographic Assumptions

Actual ages at service retirement
Pay increases to individual members:
the portion for merit & seniority
Disability while actively employed
Separations before retirement
Mortality after retirement
Mortality before retirement

RELATIONSHIP BETWEEN PLAN GOVERNING BODY AND THE ACTUARY

The actuary should have the primary responsibility for choosing the demographic assumptions used in the actuarial valuation, making use of specialized training and experience.

The actuary and other professionals can provide guidance concerning the choice of suitable economic assumptions, but the basis of the economic assumptions is the assumed rate of inflation, a quantity which defies accurate prediction by anyone. Given an assumed rate of future inflation, however, it is very important that this rate be applied in a consistent manner in deriving the assumed rate of investment return, the economic portion of the assumption on pay increases to individual employees, and the assumed rate of growth of active member payroll. Consistent application of assumptions is an area in which the actuary has specialized training.

A sound procedure is that the actuary suggests reasonable alternatives for economic assumptions, followed by discussion involving the actuary, the Plan Governing Body, and other professionals, and the Plan Governing Body then makes a final choice from the various alternatives.

SUMMARY OF ASSUMPTIONS USED IN ACTUARIAL VALUATIONS FOR THE CONNECTICUT STATE TEACHERS' RETIREMENT SYSTEM ADOPTED BY BOARD OF TRUSTEES AFTER CONSULTING WITH ACTUARY

Economic Assumptions

The investment return rate used in making the valuation was 8.5% per year, compounded annually (net after administrative expenses). This rate of return is not the assumed real rate of return. The real rate of return is the portion of investment return which is more than the inflation rate. Considering inflation recognition of 5.0%, the 8.5% rate translates to an assumed real rate of return of 3.5%. This rate was first used for the ***June 30, 1996*** valuation.

Pay increase assumptions for individual active members are shown on page F-6. Part of the assumption for each age is for a merit and/or seniority increase, and the other 5.0% recognizes inflation. These rates were first used for the ***June 30, 1996*** valuation.

Certain towns and other reporting units did not provide updated active member census data as of June 30, 1996. As a result, we assumed the prior year's service increased by one year and the prior year's pay increased by 3%.

The Active Member Group size is assumed to remain constant at its present level.

Total active member payroll is assumed to increase 5.0% a year, which is the portion of the individual pay increase assumptions attributable to inflation. This rate was first used for the ***June 30, 1996*** valuation.

Non-Economic Assumptions

The mortality table used to measure retired life mortality was the 1971 Group Annuity Mortality Table, projected to 1984. Related values are shown on page F-4. This table was first used for the ***June 30, 1996*** valuation. Rates for active members are 75% of the above rates, and rates for disabled members are based upon an age 10 years older than the actual age.

The probabilities of retirement for members eligible to retire are shown on page F-5. These rates were first used in the ***June 30, 1996*** valuation.

The probabilities of withdrawal from service, ***death-in-service*** and ***disability*** are shown for sample ages on page F-6. The withdrawal and disability rates were first used in the June 30, 1996 valuation, and do not apply to members who are eligible for retirement. The death-in-service rates were first used in the June 30, 1996 valuation.

The entry age actuarial cost method of valuation was used in determining age and service annuity liabilities and normal cost, and separation liabilities and normal cost.

Differences in the past between assumed experience and actual experience ("actuarial gains and losses") become part of actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized to produce contribution amounts (the total of principal and interest) which are level percent of payroll contributions.

Asset Valuation Method. A market value related asset method is used as described on page D-3. This method was first used in the June 30, 1996 valuation.

The data about persons now covered and about present assets was furnished by the System's administrative staff. Although examined for general reasonableness, the data was not audited by the Actuary.

The actuarial valuation computations were made by or under the supervision of a Member of the American Academy of Actuaries (M.A.A.A.).

SINGLE LIFE RETIREMENT VALUES
BASED ON 1971 GROUP ANNUITY MORTALITY
PROJECTED TO 1984 AND 8.5% INTEREST

Sample Attained	Single Life Retirement Values				Percent of Members Dying Within Next Year	
	Present Value of $1 Monthly for Life		Future Life Expectancy (years)			
Ages	Men	Women	Men	Women	Men	Women
40	$134.61	$139.86	36.69	43.22	0.15%	0.08%
45	129.78	136.97	32.01	38.41	0.27%	0.12%
50	123.70	132.98	27.53	33.66	0.49%	0.18%
55	116.24	127.53	23.28	28.99	0.78%	0.27%
60	107.02	120.19	19.27	24.44	1.21%	0.46%
65	95.92	110.72	15.55	20.09	1.95%	0.81%
70	83.61	98.76	12.25	15.99	3.34%	1.40%
75	71.21	85.01	9.49	12.33	5.18%	2.79%
80	58.57	70.94	7.17	9.28	8.30%	4.92%
85	47.69	57.03	5.43	6.78	12.50%	8.03%
Ref:	68 x 1.00	69 x 1.00				

RETIREMENT RATES

Age	Normal	Early	Proratable
45		1.0%	
46		1.0%	
47		1.0%	
48		1.0%	
49		1.0%	
50		12.0%	
51		12.0%	
52		13.0%	
53		13.0%	
54		14.0%	
55	20.0%	15.0%	
56	20.0%	16.0%	
57	20.0%	17.0%	
58	20.0%	17.0%	
59	20.0%	17.0%	
60	20.0%		10.0%
61	20.0%		10.0%
62	20.0%		10.0%
63	20.0%		10.0%
64	20.0%		10.0%
65	30.0%		10.0%
66	30.0%		10.0%
67	30.0%		10.0%
68	30.0%		10.0%
69	30.0%		10.0%
70	50.0%		100.0%
71	50.0%		100.0%
72	50.0%		100.0%
73	50.0%		100.0%
74	50.0%		100.0%
75	100.0%		100.0%
Ref	374		

increase of 10% because of early retirement changes

SEPARATIONS FROM ACTIVE EMPLOYMENT BEFORE AGE AND SERVICE RETIREMENT AND INDIVIDUAL PAY INCREASES

Sample Ages	Service	Percent of Active Members Separating Within the Next Year					
		Death		Disability		Other	
		Men	Women	Men	Women	Men	Women
	0					14.0%	14.0%
	1					12.0%	12.0%
	2					8.0%	8.0%
	3					7.0%	7.0%
	4					6.0%	6.0%
20	5 & Up	0.03%	0.02%	0.05%	0.05%	6.0%	6.0%
25		0.04%	0.02%	0.05%	0.05%	6.0%	6.0%
30		0.06%	0.03%	0.04%	0.04%	5.0%	5.0%
35		0.08%	0.04%	0.04%	0.04%	4.0%	4.0%
40		0.11%	0.06%	0.05%	0.07%	2.5%	2.5%
45		0.20%	0.09%	0.14%	0.12%	1.5%	1.5%
50		0.36%	0.14%	0.47%	0.26%	1.5%	1.5%
55		0.59%	0.21%	0.86%	0.44%	1.0%	1.0%
60		0.90%	0.35%	1.00%	0.50%	0.0%	0.0%
65		1.46%	0.61%	1.00%	0.50%	0.0%	0.0%
Ref:		0.75 x 68	0.75 x 69	0.5 x 134	0.5 x 135	170 293	170 293

Age	Pay Increase Assumptions For an Individual Member		
	Merit & Seniority	Base (Economic)	Increase Next Year
20	3.1%	5.0%	8.1%
25	2.5%	5.0%	7.5%
30	2.1%	5.0%	7.1%
35	1.9%	5.0%	6.9%
40	1.7%	5.0%	6.7%
45	1.3%	5.0%	6.3%
50	0.9%	5.0%	5.9%
55	0.5%	5.0%	5.5%
60	0.1%	5.0%	5.1%
65	0.0%	5.0%	5.0%
Ref:	88		

GLOSSARY

Accrued Service. The service credited under the plan which was rendered before the date of the actuarial valuation.

Accumulated Benefit Obligation. The actuarial present value of vested and non-vested benefits based on service to date and past and current salary levels.

Actuarial Accrued Liability. The difference between (i) the actuarial present value of future plan benefits, and (ii) the actuarial present value of future normal cost. Sometimes referred to as "accrued liability" or "past service liability."

Actuarial Assumptions. Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate 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 plan benefits" between the actuarial present value of future normal cost and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method."

Actuarial Equivalent. A single amount or series of amounts of equal value to another single amount or series of amounts, computed on the basis of the rate(s) of interest and mortality tables used by the plan.

Actuarial Present Value. The amount of funds presently required to provide a payment or series of payments in the future. It is determined by discounting the future payments at a predetermined rate of interest, taking into account the probability of payment.

Actuarial Present Value of Credited Projected Benefits or Pension Benefit Obligation. The present value of future benefits based on service to date and the effect projected salary increases.

Actuary. A person who is trained in the applications of probability and compound interest to problems in business and finance that involve payment of money in the future, contingent upon the occurrence of future events. Most actuaries in the United States are Members of the American Academy of Actuaries. The Society of Actuaries is an international research, education and membership organization for actuaries in the life and health insurance, employee benefits, and pension fields. It administers a series of examinations leading initially to Associateship and the designation A.S.A. and ultimately to Fellowship with the designation F.S.A.

Amortization. Paying off an interest-bearing liability by means of periodic payments of interest and principal, as opposed to paying it off with a lump sum payment.

Experience Gain (Loss). A measure of the 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. Sometimes referred to as "current service cost." Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

Pension Benefit Obligation. A standardized disclosure measure of the present value of pension benefits, adjusted for the effects of projected salary increases, estimated to be payable in the future as a result of employee service to date. The measure is the actuarial present value of credited projected benefits and is intended to (i) help users assess the plan's funding status on a going-concern basis, (ii) assess progress being made in accumulating sufficient assets to pay benefits when due, and (iii) allow for comparisons among public employee retirement plans. The measure is independent of the actuarial funding method used to determine contributions to the plan.

Plan Termination Liability. The actuarial present value of future plan benefits based on the assumption that there will be no further accruals for future service and salary. The termination liability will generally be less than the liabilities computed on a "going concern" basis and is not normally determined in a routine actuarial valuation.

Reserve Account. An account used to indicate that funds have been set aside for a specific purpose and are not generally available for other uses.

Unfunded Actuarial Accrued Liability. The difference between the actuarial accrued liability and valuation assets. Sometimes referred to as "unfunded accrued liability."

Valuation Assets. The value of current plan assets recognized for valuation purposes. Generally based on book value plus a portion of unrealized appreciation or depreciation.