

Connecticut State  
Teachers' Retirement System  
Annual Actuarial Valuation as of  
June 30, 1996

Gabriel, Roeder, Smith & Company



# REPORT OF THE JUNE 30, 1996 ACTUARIAL VALUATION OUTLINE OF CONTENTS

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**GABRIEL, ROEDER, SMITH & COMPANY**  
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January 20, 1997

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

Dear Members of the Board:

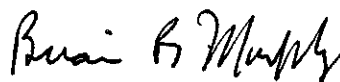
*The results of the annual actuarial valuation of the Connecticut State Teachers' Retirement System as of June 30, 1996 are presented in this report.* This valuation is based upon the Teachers' Retirement System benefit provisions, as described in Section C of this report.

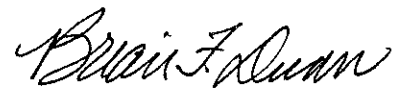
*The census and financial operations data* necessary for an actuarial valuation were furnished by the Retirement System in the Fall of 1996. Preparation of this data requires considerable staff time. The helpful cooperation of the Administrator and his staff in furnishing the data is acknowledged with 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

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This is the first actuarial valuation of the Connecticut State Teachers' Retirement System prepared by Gabriel, Roeder, Smith & Company. In future years, we will respond to the Retirement Board's requests for additional analysis and statistical results of the annual valuation process.

Recent favorable asset returns have gradually improved the funded status of the plan. We also note that these returns have also served to increase the Excess Earnings Account balance.

*Section A*

*Financial Principles*



## FINANCIAL PRINCIPLES AND OPERATIONAL TECHNIQUES

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***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?

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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

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*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.

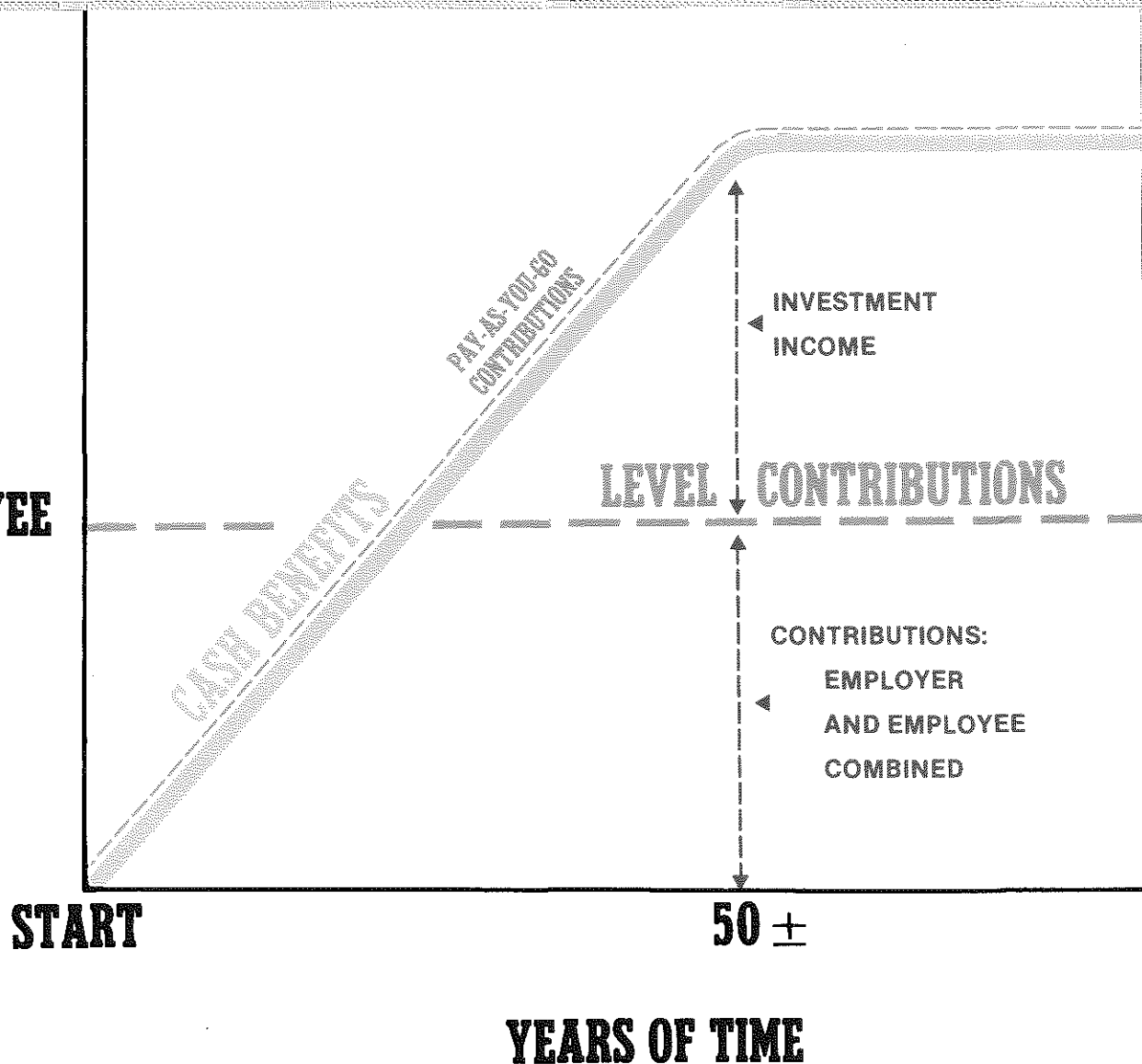
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*The actuarial valuation* is the mathematical process by which the level contribution rate is determined, and the flow of activity constituting the valuation may be summarized as follows:

- 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**



# % OF ACTIVE EMPLOYEE PAYS



**CASH BENEFIT 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

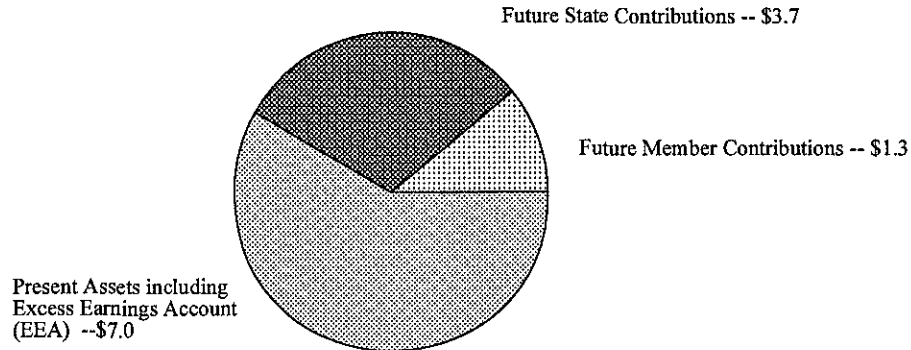
- Ages at actual retirement
- Rates of mortality
- Rates of withdrawal of active members (turnover)
- Rates of disability

***Section B***

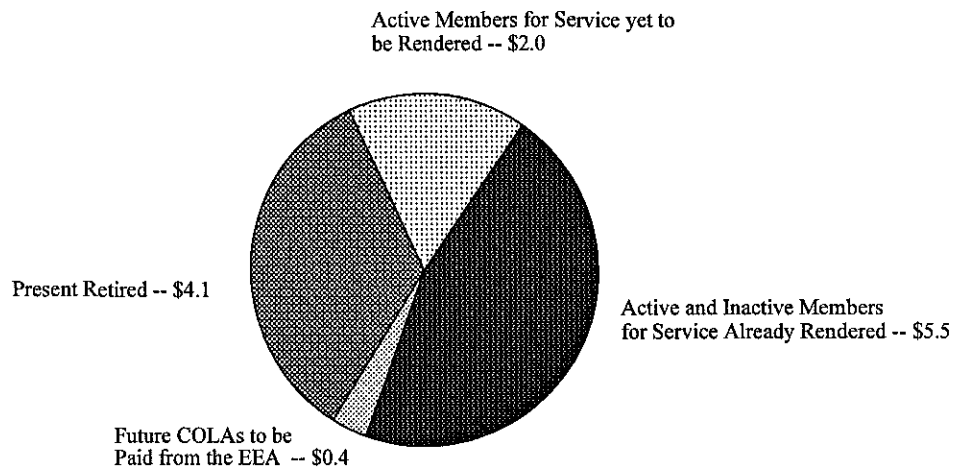
***Results of Valuation***



# Financing \$12.0 Billion\* of Benefit Promises For Present Active and Retired Members June 30, 1996



## Sources of Funds



## Uses of Funds

\* Present value of future benefits.  
All amounts are in billions.

**STATE CONTRIBUTION RATE COMPUTED AS OF JUNE 30, 1996  
FOR THE TWO-YEAR PERIOD BEGINNING JULY 1, 1997**

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Computed Contributions for	Percents of Active Member Payroll
Normal Cost	
Age and service annuities	7.31%
Separation benefits	1.47
Disability annuities	0.24
Death-in-service annuities	<u>0.16</u>
Total	9.18%
 Member Contributions	 <u>6.00</u>
 Employer Normal Cost	 3.18%
 Unfunded Actuarial Accrued Liabilities:	
Plan in effect 6/30/91 (36 years)	10.10%
Public Act 82-91 (17 years)	0.12
Public Act 87-381 (22 years)	0.01
Public Act 92-205 (27 years)	<u>(4.28)</u>
Total	5.95%
 <b>State Contribution Rate</b>	 <b>9.13%</b>

*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, 1996**

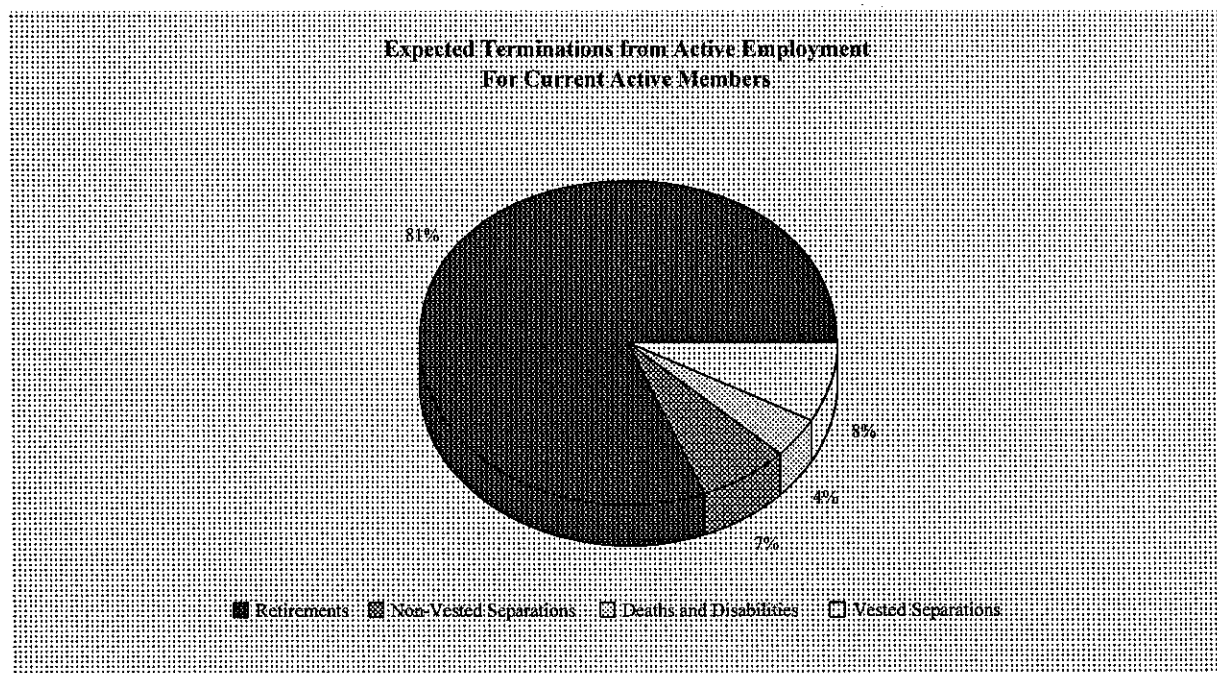
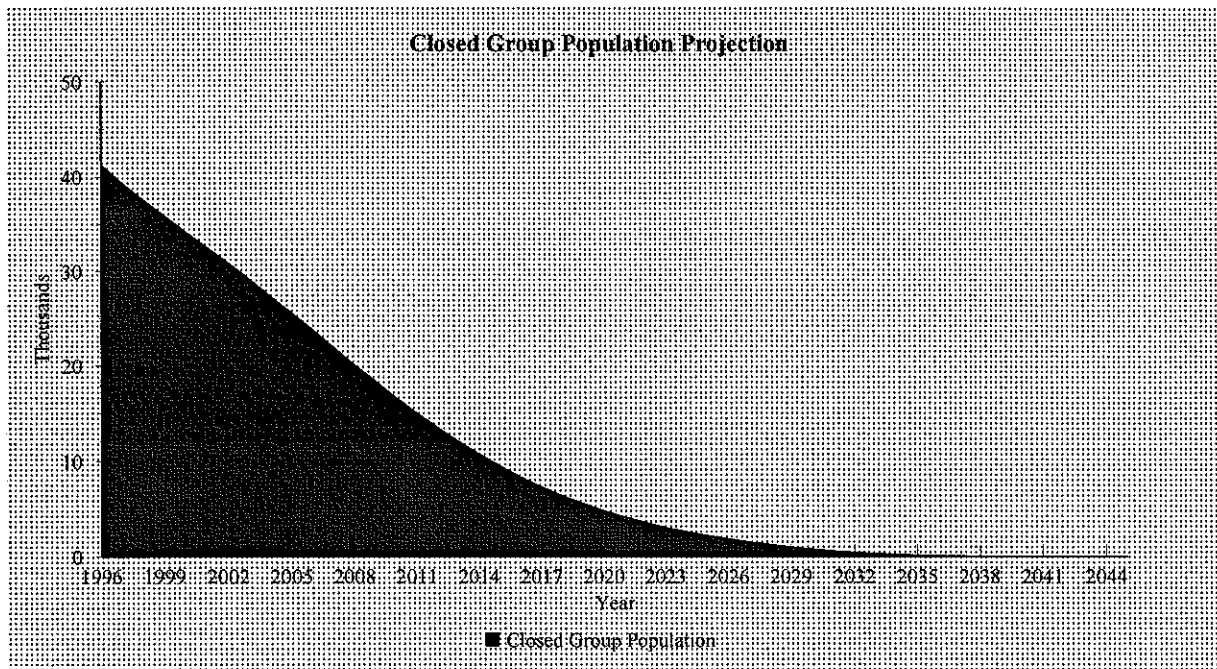
<b>Actuarial Present Value of</b>	<b>(1) Total Present Value</b>	<b>Entry Age Actuarial Cost Method</b>	
		<b>(2) Portion Covered By Future Normal Cost Contributions</b>	<b>(3) Actuarial Accrued Liabilities (1) - (2)</b>
Age and service allowances based on total service likely to be rendered by present active members	\$6,768,690,143	\$1,558,255,887	\$5,210,434,256
Separation benefits (refunds of contributions, and deferred allowances) likely to be paid present active members	220,828,272	315,165,215	(94,336,943)
Disability benefits likely to be paid present active members	75,119,838	50,572,184	24,547,654
Death in service benefits likely to be paid on behalf of present active members	113,414,226	33,626,661	79,787,565
Voluntary and 1% contribution account	237,335,337	0	237,335,337
Benefits payable to present retirees and beneficiaries	4,099,340,477	0	4,099,340,477
Deferred benefits payable to members who terminated with vested rights	69,664,846	0	69,664,846
Future Cost of Living Adjustments to be paid from the Excess Earnings Account	<u>401,745,639</u>	<u>0</u>	<u>401,745,639</u>
<b>Total</b>	<b>\$11,986,138,778</b>	<b>\$1,957,619,947</b>	<b>\$10,028,518,831</b>
Applicable assets including EEA balance			<u>7,049,916,407</u>
Unfunded actuarial accrued liabilities			<b>\$ 2,978,602,424</b>

**COMPUTED ACTUARIAL LIABILITIES  
AS OF JUNE 30, 1996**

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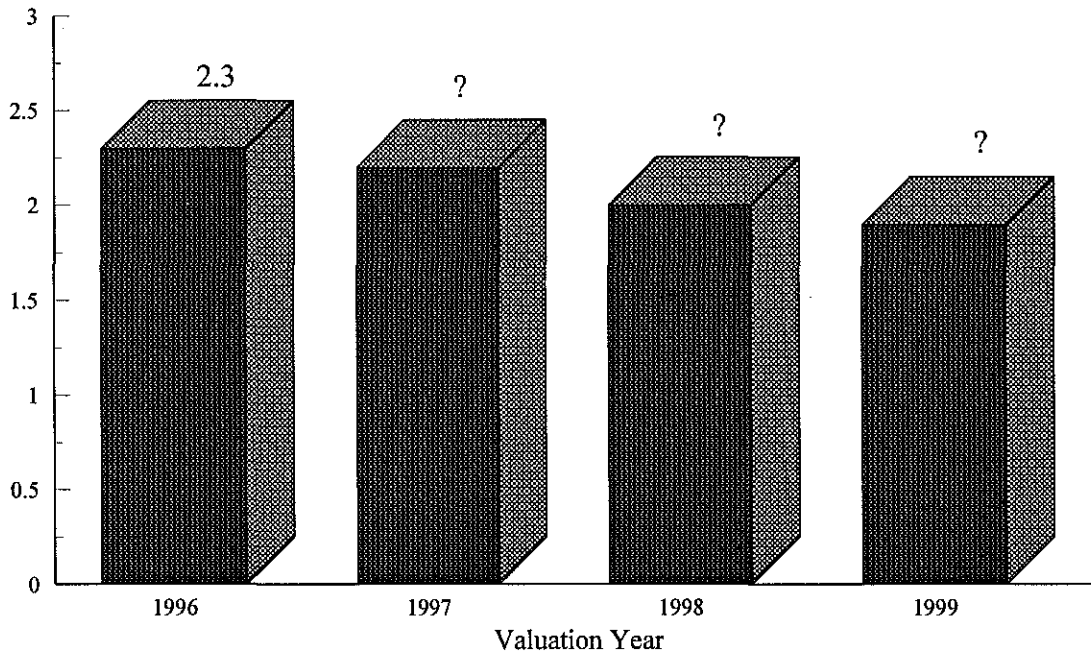
Various Acts have provided benefit changes for groups of plan members. These liabilities are included in the unfunded actuarial accrued liabilities shown on the previous page, and the resulting added contribution is included in the employer contribution rate shown in this report. At June 30, 1996, the remaining unfunded actuarial accrued liability was \$2,978,602,424.

## Expected Development of Present Population June 30, 1996



The charts show the expected future development of the present population in simplified terms. The retirement system presently covers 41,370 active members. Eventually, 7% of the population is expected to terminate covered employment prior to retirement and forfeit eligibility for an employer provided benefit. Nearly 89% 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. Four percent of the present population is expected to become eligible for death-in-service or disability benefits. Within 12 years, over half of the covered membership is expected to consist of new hires.

## Active Members Per Retired Life



It is typical in a retirement system such as this one to see the ratio of active members per retired life decrease over time. A projection study would show the expected rate of decrease.





*Section C*

*Summary of Benefits*



## SUMMARY OF PROVISIONS

### JUNE 30, 1996

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

#### **1. Covered Employees**

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

#### **2. Salary**

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

#### **3. Average Annual Salary**

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

#### **4. Credited Service**

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

## **5. Normal Retirement**

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

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

plus

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

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

## **6. Early Retirement**

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

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

## **7. Proratable Retirement**

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

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

## **8. Disability Retirement**

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

## 11. Form of Annuity

Normal: Partial Refund Option - 75% of total benefit is paid as a life annuity. If 25% of the benefits paid prior to death do not exceed the Member's 6% contributions plus interest frozen at the date of benefit commencement, the difference is paid to 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, 1996

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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:

	<u>Annual Amount</u>
F. Formula Benefit: $2\% \times A \times B$	\$25,600
G. Adjustment for Line E election $(1 - .800) \times \$25,600$	<u>5,120</u>
H. Net Annual Benefit Payable	\$20,480

Subject to the availability of funds in the Excess Earnings Account, this benefit could be increased between 1.5% and 6%, depending on the Teachers' Retirement Fund investment returns and the rate of increases in Social Security benefits.



*Section D*

*Financial Information*



## ASSET VALUATION METHOD

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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	1996	1997	1998	1999
A. Funding Value Beginning of Year	\$6,497,786,986			
B. Market Value End of Year	7,417,708,234			
C. Market Value Beginning of Year	6,646,332,714			
D. Non-Investment Net Cash Flow	(155,208,468)			
E. Investment Return				
E1. Market Total: B-C-D	926,583,988			
E2. Assumed Rate	8.50%			
E3. Amount for Immediate Recognition	545,715,534			
E4. Amount for Phased In Recognition	380,868,454			
F. Phased-In Recognition of Investment Return				
F1. Current Year:0.25xE4	95,217,114	0	0	
F2. First Prior Year	69,728,226	\$ 95,217,114	0	
F3. Second Prior Year	(57,315,964)	69,728,226	\$ 95,217,114	
F4. Third Prior Year	<u>53,992,979</u>	<u>(57,315,964)</u>	<u>69,728,226</u>	<u>\$95,217,111</u>
F5. Total Recognized Investment Gain	161,622,355	107,629,376	164,945,340	95,217,111
G. Funding Value End of Year: A+D+E3+F5	7,049,916,407			
H. Difference Between Market & Funding Values	367,791,827	260,162,451	95,217,111	0
I. Recognized Rate of Return	11.02%			

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	1993	1994	1995	1996
A. Funding Value Beginning of Year	\$5,129,003,480	\$5,595,464,382	\$6,048,414,944	\$6,497,786,986
B. Market Value End of Year	5,846,443,000	5,985,605,850	6,646,332,714	7,417,708,234
C. Market Value Beginning of Year	5,305,850,000	5,846,443,000	5,985,605,850	6,646,332,714
D. Non-Investment Net Cash Flow	(106,805,000)	(102,818,000)	(126,907,731)	(155,208,468)
E. Investment Return				
E1. Market Total: B-C-D	647,398,000	241,980,850	787,634,595	926,583,988
E2. Assumed Rate	8.50%	8.50%	8.50%	8.50%
E3. Amount for Immediate Recognition	431,426,083	471,244,707	508,721,692	545,715,534
E4. Amount for Phased In Recognition	215,971,917	(229,263,857)	278,912,903	380,868,454
F. Phased-In Recognition of Investment Return				
F1. Current Year:0.25xE4	53,992,979	(57,315,964)	69,728,226	95,217,114
F2. First Prior Year	1,152,840	53,992,979	(57,315,964)	69,728,226
F3. Second Prior Year	86,694,000	1,152,840	53,992,979	(57,315,964)
F4. Third Prior Year	<u>0</u>	<u>86,694,000</u>	<u>1,152,840</u>	<u>53,992,979</u>
F5. Total Recognized Investment Gain	141,839,819	84,523,855	67,558,081	161,622,355
G. Funding Value End of Year: A+D+E3+F5	5,595,464,382	6,048,414,944	6,497,786,986	7,049,916,407
H. Difference Between Market & Funding Values	250,978,618	(62,809,094)	148,545,728	367,791,827
I. Recognized Rate of Return	11.29%	10.02%	9.63%	11.02%

## EXCESS EARNINGS ACCOUNT BALANCE AS OF JUNE 30, 1996

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The Excess Earnings Account was established on January 1, 1992, pursuant to PA 92-205. After 1992, the Excess Earnings Account will be debited for the actuarial present value of cost-of-living adjustments to pensions of retired members whose dates of retirement are on or after September 1, 1992 and will be credited with excess investment earnings for any year in which the rate of investment return exceeds 11.5%. The Excess Earnings Account, as of June 30, 1996 is shown below:

1.	Excess Earnings Account Balance, 1/1/92	\$250,506,578	(1)
2.	Excess Investment Earnings for CY 1992	<u>0</u>	(2)
3.	Excess Earnings Account Balance, 12/31/92	\$250,506,578	
4.	Actuarial Liability for 7/1/93 COLA	(56,045)	(3)
5.	Excess Investment Earnings for CY 1993	<u>40,647,630</u>	(4)
6.	Excess Earnings Account Balance, 12/31/93	\$291,098,163	
7.	Actuarial Liability for 1/1/94 COLA	(241,664)	(5)
8.	Actuarial Liability for 7/1/94 COLA	(3,797,328)	(6)
9.	Excess Investment Earnings for FY 1994	<u>0</u>	(7)
10.	Excess Earnings Account Balance, 12/31/94	\$287,059,171	
11.	Actuarial Liability for 1/1/95 COLA	(406,195)	(8)
12.	Actuarial Liability for 7/1/95 COLA	(7,042,936)	(9)
13.	Excess Investment Earnings for FY 1995	<u>123,572,779</u>	(10)
14.	Excess Earnings Account Balance, 12/31/95	\$403,182,819	
15.	Actuarial Liability for 1/1/96 COLA	<u>(1,437,180)</u>	(11)
16.	Excess Earnings Account Balance, 6/30/96	\$401,745,639	

**Notes:**

- (1) Redetermined based on revised procedures; rate of return for CY 1991 = 16.88%
- (2) Rate of return for CY 1992 = 3.64%
- (3) 1.5% COLA; 26 retirees
- (4) Rate of return for CY 1993 = 12.24%
- (5) 2.6% COLA; 61 retirees
- (6) 2.6% COLA; 582 retirees
- (7) Rate of return for FY 1994 = 4.19%
- (8) 1.5% COLA; 153 retirees
- (9) 1.5% COLA; 1,570 retirees
- (10) Rate of return for FY 1995 = 13.64%
- (11) 2.6% COLA; 259 retirees

*The market value of the assets* of the Retirement System, as of June 30, 1996, was \$7,417,708,234.

<b>Assets</b>	<b>June 30, 1996</b>
Market value of plan assets	\$7,417,708,234
Market value adjustment	<u>(367,791,827)</u>
Funding value of assets prior to adjustment for Excess Earnings Account	\$7,049,916,407
Excess Earnings Account balance	<u>(401,745,639)</u>
Net funding value of plan assets	\$6,648,170,768

*In financing* the Retirement System actuarial accrued liabilities, the applicable assets of \$6,648,170,768 were applied as follows:

<b>Account</b>	<b>Assets Applied to</b>		
	<b>Retiree and Beneficiary Liabilities</b>	<b>Active and Inactive Member Liabilities</b>	<b>Totals</b>
Computed Accrued Liabilities	\$4,099,340,477	\$5,527,432,715	\$9,626,773,192
Valuation Assets	<u>4,099,340,477</u>	<u>2,548,830,291</u>	<u>6,648,170,768</u>
Unfunded Accrued Liabilities	\$ 0	\$2,978,602,424	\$2,978,602,424

A comparison of the net market value of assets at the end of each of the last two years is shown below.

	Market Value at June 30	
	1996	1995
Cash Reserve Fund	\$ 63,741,641	\$ 310,569,199
Mutual Equity Fund	3,142,547,024	2,567,083,171
Mutual Fixed Fund	2,003,991,437	1,270,407,056
International Stock	1,164,311,119	1,030,106,110
International Bond	0	420,022,718
Real Estate Fund	539,019,016	584,373,871
Commercial Mortgage	245,180,002	252,223,785
Residential Mortgage	0	27,106,256
Venture Capital Fund	166,385,639	122,563,442
Connecticut Programs	<u>94,061,359</u>	<u>60,088,956</u>
Total	\$7,419,237,737	\$6,645,144,564
Payables and Other Net Adjustments	<u>(1,529,503)</u>	<u>1,188,150</u>
Net Market Value	\$7,417,708,234	\$6,646,332,714



Assets during the year developed as follows:

### MARKET VALUE RECONCILIATION OF ASSETS

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	Year Ended June 30, 1996
Net Market Value July 1, 1995	\$6,646,332,714
<b>Additions</b>	
Employer Contributions	139,953,000
Employee Contributions	144,050,495
Change in Net Appreciation	506,605,063
Interest and Dividends	295,160,622
Gain on Sale of Securities	<u>124,818,303</u>
Total Additions	\$1,210,587,483
<b>Deductions</b>	
Benefits	429,892,715
Refunds of Contributions	<u>9,319,248</u>
Total Deductions	\$ 439,211,963
Net Increase	\$ 771,375,520
Net Market Value June 30	\$7,417,708,234

**Basic Series**

**Year-by-Year Total Returns (1926-1995)**

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	13.78	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	-28.47	-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

GABRIEL, ROEDER, SMITH & COMPANY from SBBI 1996 Yearbook

## HISTORICAL PATTERNS OF INVESTMENT RETURN, PAY INCREASES & INFLATION

Calendar Year Period	Gross Market Returns			Stocks (S&P 500)	Price Inflation (CPI)	National Average Earnings (NAE)	Sample Balanced Fund*	
	Bonds (Long)		Cash Equiv. (T Bills)				Total	Spread: I - NAE - e
	U.S. Treasury	Corp. (S&P AA)						
1940-49	3.2%	2.7%	0.4%	9.2%	5.4%	8.1%	6.1%	(2.5)%
1950-59	(0.1)	1.0	1.9	19.4	2.2	4.5	10.5	5.5
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
1990-95	11.9	11.3	4.9	13.0	3.3	3.5	11.8	7.8
<b>Last 30 Years</b>	7.9%	8.2%	6.7%	10.7%	5.4%	5.7%	9.5%	<b>3.3%</b>

* 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, 1996**  
**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		Valuation Payroll
15-19	1							1	\$ 15,960
20-24	251							251	7,340,722
25-29	2,408	291						2,699	87,558,074
30-34	1,255	1,458	360					3,073	119,943,200
35-39	830	1,056	1,344	361	1			3,592	160,905,905
40-44	1,044	1,105	1,084	2,097	807			6,137	310,164,550
45-49	970	1,391	1,349	1,396	3,205	2,034		10,345	567,781,527
50-54	384	784	1,088	1,025	1,228	3,216	1,134	8,859	513,661,806
55-59	114	215	434	553	611	867	1,543	4,337	259,526,342
60	13	20	41	71	93	110	178	526	31,436,782
61	9	19	24	57	83	65	134	391	23,115,068
62	5	13	31	37	54	69	94	303	18,229,904
63	3	8	15	32	39	46	79	222	13,583,778
64	5	10	15	31	35	35	44	175	10,582,619
65	4	11	13	17	18	36	43	142	8,304,174
66	1	4	13	13	20	25	39	115	7,220,167
67	1	4	5	13	9	14	19	65	3,854,073
68	2	1	4	4	8	12	18	49	2,847,990
69				7	2	7	12	28	1,707,704
70 & Over		1	2	4	10	10	33	60	3,794,045
<b>Totals</b>	<b>7,300</b>	<b>6,391</b>	<b>5,822</b>	<b>5,718</b>	<b>6,223</b>	<b>6,546</b>	<b>3,370</b>	<b>41,370</b>	<b>\$2,151,574,390</b>

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

- Age: 45.8 years.
- Service: 16.0 years.
- Annual Pay: \$52,008.

**MALE, FEMALE, AND TOTAL MEMBERS IN VALUATION JUNE 30, 1996  
BY YEARS OF SERVICE**

Service Years	Active Member Count			Active Member Pays	
	Males	Females	Total	Total	Average
0	76	265	341	\$ 11,320,267	\$ 33,197
1	460	1,667	2,127	66,345,816	31,192
2	396	1,388	1,784	60,508,711	33,917
3	321	1,242	1,563	57,380,702	36,712
4	257	1,228	1,485	57,721,333	38,870
5	140	785	925	38,025,596	41,109
6	189	985	1,174	50,506,204	43,021
7	219	1,022	1,241	56,243,149	45,321
8	229	1,210	1,439	67,331,711	46,791
9	268	1,344	1,612	78,763,684	48,861
10	219	1,246	1,465	73,268,433	50,013
11	261	1,195	1,456	73,525,565	50,498
12	214	911	1,125	58,175,620	51,712
13	162	743	905	47,233,056	52,191
14	141	730	871	46,831,708	53,768
15 & Up	7,972	13,885	21,857	1,308,392,835	59,862
<b>Totals</b>	<b>11,524</b>	<b>29,846</b>	<b>41,370</b>	<b>\$2,151,574,390</b>	<b>\$52,008</b>

*monthly*

**FORMER ACTIVE MEMBERS AND BENEFICIARIES  
IN PAY STATUS BY PLAN CODE**

**Number in Each Plan Code**

Plan	Retirees	Beneficiaries*	Disabled	Total
A (Life Annuity)	989	0	22	1,011
B (100% Cash Refund)	1,472	0	14	1,486
C (Period Certain and Life)	1,553	288	18	1,859
D (Joint and Survivor)	2,017	395	0	2,412
N (25% Cash Refund)	10,363	15	18	10,396
S (Survivor)	0	554	0	554
W (Disability)	<u>0</u>	<u>2</u>	<u>230</u>	<u>232</u>
	16,394	1,254	302	17,950

**Number in Each Plan Code**

Plan	Retirees	Beneficiaries*	Disabled	Total
A (Life Annuity)	\$ 1,306,995	\$ 0	\$ 16,480	\$ 1,323,475
B (100% Cash Refund)	2,138,069	0	10,585	2,148,654
C (Period Certain and Life)	2,760,141	476,442	15,630	3,252,213
D (Joint and Survivor)	5,180,441	539,242	0	5,179,683
N (25% Cash Refund)	22,360,286	13,772	17,221	22,391,279
S (Survivor)	0	147,200	0	147,200
W (Disability)	<u>0</u>	<u>1,337</u>	<u>406,679</u>	<u>408,016</u>
	\$33,745,932	\$1,177,993	\$466,595	\$35,390,520

\* *Beneficiaries category includes 554 Surviving Spouses and Dependents combined.*

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

Year	Number	Annuity	Pension	Voluntary	Total	Average
1996	111	\$ 0	\$ 185,570	\$ 9,526	\$ 195,096	\$1,758
1995	1,117	0	2,849,901	63,301	2,913,202	2,608
1994	1,113	0	2,872,987	71,394	2,944,381	2,645
1993	646	0	1,429,719	36,583	1,466,302	2,270
1992	2,054	0	5,544,444	132,807	5,678,368	2765
1991	1,017	0	2,472,379	62,490	2,534,869	2,492
1990	1,016	164	2,286,608	62,082	2,348,854	2,312
1989	941	0	2,058,853	67,671	2,126,524	2,260
1988	674	274,784	1,027,803	40,752	1,343,339	1,993
1987	660	249,328	943,861	38,792	1,231,981	1,867
1986	722	254,343	1,032,223	37,411	1,323,977	1,834
1985	714	228,846	957,997	34,962	1,221,805	1,711
1984	663	188,861	863,526	20,793	1,073,180	1,619
1983	608	156,033	761,909	18,219	936,161	1,540
1982	623	143,148	751,638	14,278	909,064	1,459
1981	547	113,352	620,392	13,648	747,392	1,366
1980	473	68,410	580,512	9,153	658,075	1,391
1979	494	68,463	637,199	12,030	717,692	1,453
1978	430	51,403	508,533	11,171	571,107	1,328
1977	444	49,818	556,325	9,664	615,807	1,387
1976	377	42,177	500,078	5,709	547,964	1,453
1975	326	31,208	434,048	4,321	469,577	1,440
1974	310	26,104	386,828	6,711	419,643	1,354
1973	329	28,240	439,469	5,547	473,256	1,438
1972	349	28,091	428,337	5,413	461,841	1,323
1971	218	17,359	275,381	3,877	296,617	1,361
1970	190	13,446	224,887	4,104	242,437	1,276
1969	150	9,001	167,675	4,747	181,423	1,209
1968	163	9,673	181,547	4,164	195,384	1,199
1967	81	4,501	95,632	2,871	103,004	1,272
1966	71	3,541	76,758	2,756	83,055	1,170
1965	79	3,944	88,939	2,197	95,080	1,204
1964	38	1,816	46,866	372	49,054	1,291
1963	39	1,668	43,106	945	45,719	1,172
1962	39	1,519	42,320	954	44,793	1,149
1961	38	1,268	37,302	922	39,492	1,039
1960	27	922	28,623	1,202	30,747	1,139
1959	15	473	13,405	900	14,778	985
1958	8	226	7,032	300	7,558	945
1957	11	290	8,658	0	8,948	813
1956	7	224	7,335	0	7,559	1,080
1955	4	117	4,169	0	4,286	1,072
1954	3	118	3,106	0	3,224	1,075
1953	4	106	3,076	0	3,182	796
1952	4	79	2,739	0	2,818	705
1951	0	0	0	0	0	0
1950	0	0	0	0	0	0
1949	0	0	0	0	0	0
1948	1	5	427	0	432	432
1947	1	0	526	0	526	526
1946	1	14	933	0	947	947
<b>Total</b>	<b>17,950</b>	<b>\$2,073,083</b>	<b>\$32,491,581</b>	<b>\$824,739</b>	<b>\$35,390,520</b>	<b>\$1,972</b>



***Section F***

***Financial Reporting (GASB)***



**PENSION BENEFIT OBLIGATION  
 REQUIREMENT OF GOVERNMENTAL ACCOUNTING STANDARDS  
 BOARD STATEMENT NO. 5**

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The amount shown below as the "pension benefit obligation" is 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.*

The pension benefit obligation was determined as part of an actuarial valuation of the plan. Significant actuarial assumptions used in determining the pension benefit obligation include (a) a rate of return on the investment of present and future assets of 8.5% per year compounded annually, (b) projected salary increases of 5.0% per year compounded annually, attributable to inflation, (c) additional projected salary increases ranging from 0.0% to 3.8% per year, depending on age, attributable to seniority/merit, and (d) the assumption that benefits will increase 4% per year after retirement for members who retired prior to September 1, 1992.

The unfunded pension benefit obligation was determined as follows:

	<b>June 30, 1996</b>
<b>Pension Benefit Obligation:</b>	
Retirees, beneficiaries, survivors and dependents currently receiving benefits and other inactive members not yet receiving benefits	\$4,169,005,323
Accumulated employee contributions for inactive members	80,569,733
<b>Current employees --</b>	
Accumulated employee contributions (including voluntary and 1%)	2,196,272,185
Employer financed - Vested	2,560,085,809
Employer financed - Non-vested	<u>104,158,198</u>
<b>Total Pension Benefit Obligation</b>	<b>\$9,110,091,248</b>
Net assets available for benefits, at cost, excluding EEA	<u>4,933,107,639</u>
<b>Unfunded Pension Benefit Obligation</b>	<b>\$4,176,983,609</b>

**STATEMENT OF PLAN NET ASSETS  
AS OF JUNE 30, 1995 AND 1996**

	Market Value at June 30	
	1996	1995
Cash Reserve Fund	\$ 63,741,641	\$ 310,569,199
Mutual Equity Fund	3,142,547,024	2,567,083,171
Mutual Fixed Fund	2,003,991,437	1,270,407,056
International Stock	1,164,311,119	1,030,106,110
International Bond	0	420,022,718
Real Estate Fund	539,019,016	584,373,871
Commercial Mortgage	245,180,002	252,223,785
Residential Mortgage	0	27,106,256
Venture Capital Fund	166,385,639	122,563,442
Connecticut Programs	<u>94,061,359</u>	<u>60,088,956</u>
Total	\$7,419,237,737	\$6,645,144,564
Payables and Other Net Adjustments	<u>(1,529,503)</u>	<u>1,188,150</u>
Net Market Value	\$7,417,708,234	\$6,646,332,714

A schedule of funding progress for the plan is presented on page F-7.

**STATEMENT OF CHANGES IN PLAN NET ASSETS  
FOR THE FISCAL YEARS ENDED JUNE 30, 1995 AND 1996**

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	<b>Reconciliation as of June 30, 1996</b>	<b>Reconciliation as of June 30, 1995</b>
<b>Additions</b>		
Contributions		
Employer	\$ 139,953,000	\$ 132,503,932
Plan members	<u>144,050,495</u>	<u>141,271,851</u>
Total contributions	\$ 284,003,495	\$ 273,775,783
Investment return		
Net appreciation	\$ 506,605,063	\$ 503,125,368
Interest and dividends	295,160,622	269,282,669
Gain on sale of securities	124,818,303	11,896,097
Miscellaneous, including adjustments	<u>0</u>	<u>3,330,461</u>
Net investment return	\$ 926,583,988	\$ 787,634,595
 Total additions	 \$1,210,587,483	 \$1,061,410,378
 <b>Deductions</b>		
Benefits	\$ 429,892,715	\$ 392,589,445
Refunds of contributions	<u>9,319,248</u>	<u>8,094,069</u>
Total deductions	\$ 439,211,963	\$ 400,683,514
 Net increase	 \$ 771,375,520	 \$ 660,726,864
 Net assets held in trust for pension benefits*		
Beginning of year	6,646,332,714	5,985,605,850
End of year	<u>\$7,417,708,234</u>	<u>\$6,646,332,714</u>

\* Includes Excess Earnings Account balances of \$401,745,639 as of June 30, 1996, \$286,652,976 as of June 30, 1995 and \$290,856,499 as of June 30, 1994.

The calculation of realized gains and losses is independent of the calculation of net appreciation (depreciation) in the fair value of plan investments. Unrealized gains and losses in investments sold in the current year that had been held for more than one year were included in the net appreciation (depreciation) reported in the prior years and the current year.

**NOTES TO THE FINANCIAL STATEMENTS  
FOR THE FISCAL YEAR ENDED JUNE 30, 1996**

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A. Summary of Significant Accounting Policies

**Bases of Accounting.** The accompanying financial statements are on the accrual basis of accounting.

**Methods Used to Value Investments.** Investments are reported at fair value. Short-term investments are reported at cost, which approximates fair value. Securities traded on a national or international exchange are valued at the last reported sales price at current exchange rates. Mortgages are valued on the basis of future principal and interest payments, and are discounted at prevailing interest rates for similar instruments. The fair value of real estate investments is based on independent appraisals. Investments that do not have an established market are reported at estimated fair value.

B. Plan Description and Contribution Information

Membership information as of June 30, 1996, the date of the latest actuarial valuation, is as follows:

Retirees and beneficiaries	17,396
Surviving spouses and dependents	554
Terminated vested and other inactive members	5,950
Active members	<u>41,370</u>
 Total	 65,270

**Plan Description.** The Connecticut State Teachers' Retirement System is a defined benefit pension plan that covers the teachers, principals, superintendents, and supervisors in the public schools of the State of Connecticut, plus professional employees of State schools of higher education who choose to be covered.

The plan provides retirement, disability, and death benefits to plan members and their beneficiaries.

**Contributions.** Plan members contribute 6% of pay to the Fund for pension benefits.

The employer's funding policy provides for periodic employer contributions based upon a *fundamental financial objective of having rates of contribution which remain relatively level from generation to generation of the Connecticut citizens.* To determine the employer contribution rates and to assess the extent to which the fundamental financial objective is being achieved, the System has actuarial valuations prepared annually. In preparing those valuations, the entry age actuarial cost method is used to determine normal cost and actuarial accrued liabilities.

Unfunded actuarial accrued liabilities are amortized by level percent-of-payroll contributions over a period of future years. The unfunded accrued liability as of June 30, 1981 was initially amortized over a 40-year period of which 36 years remain. Other increases/decreases in unfunded accrued liability are amortized over periods of 30 years or less.

On the basis of the June 30, 1996 actuarial valuation, the employer contribution rate was determined to be as follows:

<b>Contributions for</b>	<b>Percent of Active Member Payroll</b>
Normal Cost	3.18%
Accrued Liabilities	<u>5.95</u>
Total Employer Rate	9.13%

**REQUIRED SUPPLEMENTARY INFORMATION**  
**SCHEDULE OF FUNDING PROGRESS**  
**(DOLLAR AMOUNTS IN MILLIONS)**

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) - Entry Age (b)	Unfunded AAL (UAAL) (b)-(a)	Funded Ratio (a)/(b)	Covered Payroll (c)	UAAL as a Percent of Covered Payroll (b)-(a) (c)
6/30/91	\$4,692.0	\$8,152.7	\$3,460.7	57.6%	\$1,792.5	193.1%
6/30/92*	4,848.0	7,278.2	2,430.2	66.6	1,841.9	131.9
6/30/93#						
6/30/94	5,602.1	8,222.6	2,620.5	68.1	2,030.4	129.1
6/30/95#						
6/30/96	6,648.2	9,626.8	2,978.6	69.1	2,151.6	138.4

\* After change in benefit provisions.

# No actuarial valuations were performed as of June 30, 1993 and June 30, 1995.

## SCHEDULE OF EMPLOYER CONTRIBUTIONS

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Year Ended June 30	Annual Required Contribution	Actual Contributions	Percent Contributed
1991	\$304,331,000	\$156,638,000	51.5%
1992	308,724,000	133,057,000	43.1
1993	299,589,000	111,600,000	37.3
1994	145,786,000	124,254,000	85.2
1995	154,036,000	132,503,932	86.0
1996	164,650,000	139,953,000	85.0



## SUMMARY OF ACTUARIAL METHODS AND ASSUMPTIONS

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The information presented in the required supplementary schedules was determined as part of the actuarial valuations at the dates indicated. Additional information as of the latest actuarial valuation follows:

Valuation date	June 30, 1996	
Actuarial cost method	Entry age actuarial cost method	
Amortization method	Level percent of pay	
Remaining amortization periods	Plan in effect 6/30/91	36 years
	Public Act 82-91	17 years
	Public Act 87-381	22 years
	Public Act 92-205	27 years
Asset valuation method	4-year smoothed market	
Actuarial assumptions:		
Investment rate of return*	8.5%	
Projected salary increases*	5.0% - 8.1%	
*Includes inflation at	5.0%	
Cost-of-living adjustments for retirements prior to 9/1/92	4.0%	

***Section G***

***Actuarial Assumptions and  
Miscellaneous***



## SELECTION OF ASSUMPTIONS USED IN ACTUARIAL VALUATIONS

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### 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

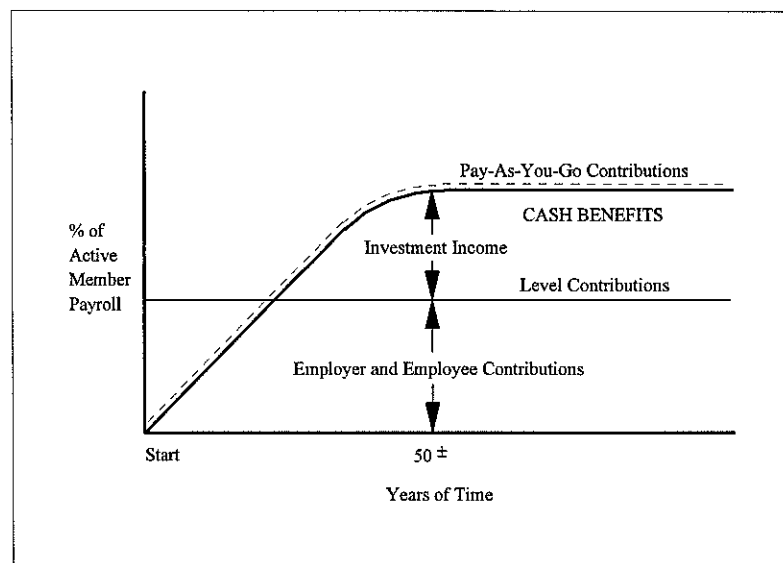
Pay increases to individual members:  
the portion for merit & seniority

Disability while actively employed

Separations before retirement

Mortality after retirement

Mortality before retirement



## RELATIONSHIP BETWEEN PLAN GOVERNING BODY AND THE ACTUARY

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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**

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***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 G-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 G-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 G-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 G-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.

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*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.

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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**

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Sample Attained Ages	Present Value of \$1.00 Monthly for Life		Future Life Expectancy (Years)		Percent of Actual Members Dying Within Next Year	
	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	9.50	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

[68,69]

## RETIREMENT RATES

Age	Normal	Early	Proratable
45		1.0%	
46		1.0	
47		1.0	
48		1.0	
49		1.0	
50		2.0	
51		2.0	
52		3.0	
53		3.0	
54		4.0	
55	20.0%	5.0	
56	20.0	6.0	
57	20.0	7.0	
58	20.0	7.0	
59	20.0	7.0	
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

## 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	1.00	0.0	0.0	
65	1.46	0.61	1.00	1.00	0.0	0.0	
Ref:		.75 x 68	.75 x 69	.5 x 134	.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

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**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.