ACTUARIAL VALUATION

OF THE

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

AT

JUNE 30, 1989

Milliman &
Robertson, Inc.
Consulting Actuaries

MILLIMAN & ROBERTSON, INC.
CONSULTING ACTUARIES

THREE CORPORATE PLACE
BLOOMFIELD, CONNECTICUT 06002
203/243-1138

November 10, 1989

State of Connecticut
State Employees Retirement Commission
55 Elm Street
Hartford, CT 06106

Re: Connecticut State Employees Retirement System

Members of the Commission:

At your request, we have made an actuarial valuation of the Connecticut State Employees Retirement System as of June 30, 1989. The results of the valuation are contained in the following report.

In Section I we present a summary of the principal results of this valuation. Details regarding system assets, liabilities, and costs are found in Sections II, III, and IV, respectively. The Appendices contain information regarding Entry Age Normal Results, System membership, an outline of the benefit provisions, and a description of actuarial methods and assumptions employed in this valuation. Finally, in Appendix E, we present details of cost increases associated with recent benefit improvements effective following the valuation date.

As summarized in Section IV, the recommended contribution for the fiscal year beginning July 1, 1990, including Federal reimbursements, is $398,016,908.

In our opinion, this report fairly presents the financial and actuarial position of the Connecticut State Employees Retirement System at June 30, 1989. On the basis of the foregoing, we hereby certify that, to the best of our knowledge, this report is complete and accurate and has been prepared in accordance with generally recognized and accepted actuarial principles and practices set forth by the American Academy of Actuaries.

Respectfully submitted,

MILLIMAN & ROBERTSON, INC.

Eugene M. Kalwarski, F.S.A.
Consulting Actuary

Althea A. Schwartz, F.S.A.
Consulting Actuary

Actuarial Valuation of the
Connecticut State Employees
Retirement System

TABLE OF CONTENTS

Section	
-	Letter of Transmittal
I	Executive Summary
II	System Assets
III	System Liabilities and Accounting Information
IV	System Contributions

APPENDICES

A	Entry Age Normal Valuation Results
B	Summary Statistics on System Membership
C	Summary of Plan Provisions
D	Actuarial Methods and Assumptions
E	Cost Adjustments: Re: Arbitrator's Decision

Section I

Executive Summary

Section I
Executive Summary

This report presents the results of our June 30, 1989 actuarial valuation of the Connecticut State Employees Retirement System.

The major findings of the valuation are summarized in the following table (results based on Projected Unit Credit Funding):

	Valuation Date	
	June 30, 1989	June 30, 1988
Market Value of Assets	$2.80 billion	$2.27 billion
Actuarial Value of Assets	2.61 billion	2.19 billion
Unfunded Actuarial Liability	2.46 billion	2.36 billion

	Projected to Fiscal Year Beginning	
	July 1, 1990	July 1, 1989
System Contributions		
• as a percent of payroll	20.77%	20.63%
• dollar amount	$398.0 million	$354.4 million

Each of the current year's figures differs from that which would have been expected, based on the prior year's results. Details of this experience and additional findings of our valuation are presented later in this section.

There were several unusual circumstances which have been reflected in the development of costs for Fiscal Year beginning July 1, 1990. They are displayed in the table which follows and are described below:

	Amount ($ in millions)	% of Payroll
Annual Contribution (EAN Cost Method before adjustments)	$ 422.6	22.05%
Effect of Change in Cost Method (EAN to PUC)	(39.7)	(2.07)
Effect of Change in Benefits (Arbitrators Award)	10.2	0.53
Effect of Retirement Incentive (Early Retirement Window)	0.0	.00
Effect of Shortfall in State's Contribution for Fiscal Year beginning July 1, 1989	4.9	0.26
Recommended Contribution for Fiscal Year beginning July 1, 1990	$ 398.0	20.77%

- The cost method has been changed from the Entry Age Normal Cost Method to the Projected Unit Credit Cost Method. In the above table, the effect of the change in cost method was developed assuming the change was reflected for the first time for Fiscal Year beginning July 1, 1990.

- The Arbitrator's Award contained several benefit improvements which resulted in increased costs.

- Approximately 3,000 employees retired early in response to the retirement incentive program.

- The actuarial certification for Fiscal Year beginning July 1, 1989 called for a contribution of $396.4 million. As a result of a preliminary estimate of $55 million in savings to switch to Projected Unit Credit funding, the State appropriated $341.4 million. Actual Projected Unit Credit costs were $354.4 million, resulting in a $13 million shortfall. In the above table, the $4.9 million cost reflects the amortization of both the $13 milllion shortfall and the cost associated with the change to Projected Unit Credit Funding for Fiscal Year beginning July 1, 1989.

Overall System Experience

The overall experience of the System was slightly less favorable than expected, based on the actuarial assumptions used in the 1988 valuation.

The primary factors which contributed to the change in the System's assets, unfunded liabilities, and contributions between June 30, 1988 and June 30, 1989 were: (1) expected changes due to the passage of time (e.g. new employees) and (2) unexpected changes due to experience gains and losses. In the absence of performing a formal experience review of the System we estimate the source of changes as follows.

Assets:

Between June 30, 1988 and June 30, 1989, the assets of the System, measured on an actuarial basis, increased by $422 million. This change was attributable to the following:

$ 403	million from State, Federal, and employee contributions
- 195	million from payment of benefits and expenses
+ 214	million from recognized investment experience
=$ 422	million total increase in assets.

Of this total change, $391 million was expected, based on our assumption that the assets of the System would earn 8½%. However, the effective investment return on the actuarial value of the assets was about 9.35%, resulting in an actuarial gain of $31 million.

On a market value basis, the assets of the System earned 13.40%, producing a gain of $128 million.

Unfunded Actuarial Liability (Projected Unit Credit):

The actual increase in the unfunded actuarial liability of the System between June 30, 1988 and June 30, 1989 was $98.8 million. This difference of $167.6 million is attributable to the following factors:

Unfunded Actuarial Liability, June 30, 1988	$2,361.2 million
• decrease due to asset gain	(31.0)
• increase due to liability and other losses	129.8
Unfunded Actuarial Liability, June 30, 1989	$2,460.0 million

For reference, the unfunded actuarial liability using the Entry Age Normal cost method was $3180.5 million as of June 30, 1989.

The liability loss of $129.8 million is attributable to the difference between actual and expected experience with respect to number of retirements, employment terminations, disabilities, deaths, salary increases, and new employees. Only a formal experience review can determine the particular amount each component contributed to the total liability loss.

We do know, however, that actual total system payroll on June 30, 1989 exceeded our prior year's projection to 1989 by $41.8 million. This difference was due to a growth in total membership (when no growth was assumed), and a greater increase in average pay per member than expected.

System Contributions:

System contributions projected to the Fiscal Year beginning July 1, 1990 are $398.0 million. This exceeds the prior year's projection of $354.4 million by $43.6 million.

The sources of this increase are as follows.

Prior year's contribution (projected to 1989)	$354.4 million
• increase due to expected payroll growth to 1990	19.1
• decrease due to asset gains	(2.7)
• increase due to liability losses and membership profile	12.1
• increase due to arbitrator's decision	10.2
• increase due to "early retirement window"	0.0
• increase due to shortfall in State contribution for Fiscal Year beginning July 1, 1989	4.9
Contribution projected to 7-1-90	$398.0 million

Details regarding the cost increase attributable to the arbitrator's decision are presented at the end of the report in Appendix E.

With respect to the cost of the early retirement window, our analysis shows zero cost impact. However, this is a highly uncertain estimate and cannot be verified until future experience develops with respect to replacements of employees who took advantage of this provision.

Based on the assumption that 3,000 employees will retire as a result of the window, we have estimated that the System will payout an additional $54 million in future benefits (present value). However, the System will realize a savings by not having to make future contributions on behalf of the retiring employees. Furthermore, if these employees are never replaced by new hires, the savings will be significantly greater than the additional benefits paid. Given the possibility that State costs could increase or decrease depending upon a highly unknown assumption regarding replacements, we chose to make no adjustments for Fiscal Year 1990-91.

Summary

During the past year, the System experienced various events which resulted in both decreases and increases in System costs. This is to be expected in future years as well since the anticipated accuracy of the actuarial assumptions are over the long term and not from year to year. Furthermore, the current actuarial funding method employed by the State (Projected Unit Credit) tends to have less stability and more sensitivity to annual experience than the prior method (Entry Age Normal). This is particularly true given the two tier benefit levels of this system.

We stated earlier that overall the System's experience was slightly less favorable than expected. The primary factors resulting in increased system costs were payroll growth, liability losses, and the benefit improvements. The first factor, payroll increases, will continue to result in increasing cost in future years, as long as payrolls increase. Liability gains and losses are expected to net out in future years (i.e. gains vs. losses). However, if a pattern of gains or losses continues over the next several years a revision in assumptions may be necessary. Finally, the effect of the benefit improvements are now a permanent part of the contribution base for the State and should generally grow with payroll.

In concluding this executive summary, we present on the following page comparative statistics and actuarial information on both the June 30, 1989 and June 30, 1988 valuations.

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

PRINCIPAL RESULTS
TOTAL SYSTEMS

	June 30, 1989	June 30, 1988
A. SYSTEM MEMBERSHIP		
1. Active Membership		
- Number of Participants	56,202	55,568
- Payroll	$1,759,543,752	$1,582,974,210
- Average Pay	31,307	28,487
2. Inactive Membership		
- Number of Vested Deferred Members	635	638
- Number of Retired Members	21,137	20,265
- Annual Retired Members Benefits	$203,854,955	$182,867,294
- Average Annual Retired Member Benefit	9,644	9,024
B. ASSETS AND LIABILITIES		
1. Assets		
- Market Value	$2,798,932,658	$2,273,151,925
- Actuarial Value	2,611,498,541	2,189,510,979
2. Liabilities		
- Retired and Deferred Vested	$2,089,129,002	$1,877,614,817
- Active Members (Projected Unit Credit)	2,982,390,546	2,673,040,405
- Total Liability	5,071,519,548	4,550,655,222
- Unfunded Liability	$2,460,021,007	$2,361,144,243
C. CONTRIBUTIONS (Projected Unit Credit)		
1. Contributions as a Percent of Payroll		
- Normal Cost	9.37%	9.15%
- Unfunded Liability	11.40%	11.49%
- Total Contribution %	20.77%	20.63%
2. Contribution Dollars Projected to the Following FY		
- Normal Cost	$179,549,626	$157,099,229
- Unfunded Liability	218,467,282	197,300,127
- Total State Contribution	398,016,908	354,399,356

7.91% for other schedule

Section II

System Assets

Section II
System Assets

In this section we present the values assigned to the assets held by the Systems. These assets are valued on two different bases: the actuarial value and the market value.

Actuarial Value of Assets:

For purposes of determining ongoing costs, the recognition of gains and losses are spread over five years. The resulting value is called the actuarial value of assets and is further adjusted as necessary so that the final actuarial value is within 20% (plus or minus) of the market value of assets.

Market Value of Assets:

For certain accounting statement purposes, System assets are valued at current market rates. These values represent the "snapshot" or "cash-out" value of System assets as of the valuation date. In addition, the market value of assets provides a reference point to compare to current accrued liabilities.

The following tables present information regarding the actuarial and market values of System assets as of June 30, 1989.

Table	Contents
II-1	Market Value - Summary of Fund Transactions
II-2	Market Value - Breakdown on June 30, 1989
II-3	Actuarial Value of Assets
II-4	Historical Summary (Actuarial and Market)

Table II-1

Market Value of Assets
Summary of Fund Transactions

Market Value July 1, 1988		$2,273,151,925
Contributions		
State	$324,314,706	
Federal	50,015,844	
Employee	28,710,609	
		$ 403,041,159
Investment Income		
Interest and Dividends	$116,130,364	
Realized Gains	(38,282,173)	
Change in Unrealized Gains	240,200,288	
		$ 318,048,479
Disbursements		
Benefit Payments	$192,959,740	
Employee Refunds	2,215,969	
Expenses	133,196	
		$ 195,308,905
Market Value June 30, 1989		$2,798,932,658
Estimated Rate of Return		13.40%

Table II-2

Market Value of Assets
Breakdown on June 30, 1989

The following is the Market Value of the State Employees Retirement Fund assets as reported to us by the Retirement Division:

	Amount	% of Total
Cash	$ (2,377,536)	-.08%
Accrued Interest	$ 3,154,061	.11%
Investments		
Cash Reserve Account	$ 140,737,586	5.03%
Fixed Income	779,571,406	27.85
Equity	1,180,849,504	42.19
Contract	1,208,500	.04
Mortgage	13,479,316	.48
Real Estate	408,067,732	14.58
International Funds	184,490,757	6.59
Commercial Mortgage Fund	76,700,312	2.74
Venture Capital Fund	13,051,020	.47
	$2,798,156,133	99.97%
Total Market Value of Assets June 30, 1989	$2,798,932,658	100.00%

Table II-3

Actuarial Value of Assets

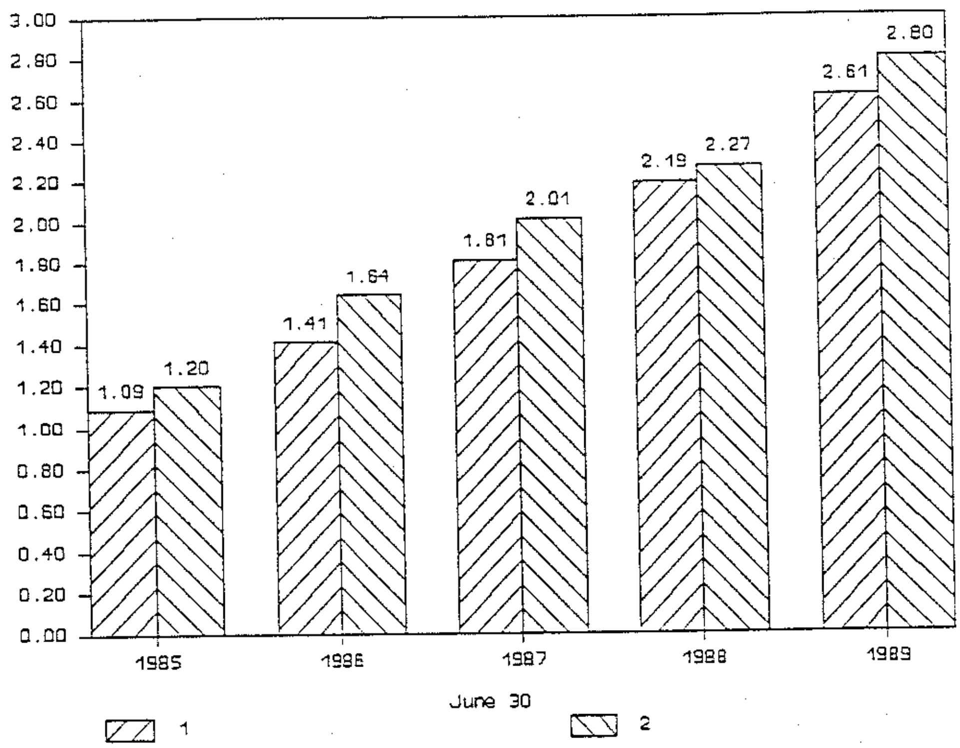
Ending	Realized Gains/Losses	Change in Unrealized Gains/Losses	Total Gains/Losses
6-30-89	$ (38,287,173)	$240,205,288	$201,918,115
6-30-88	205,394,743	(261,372,286)	(55,977,543)
6-30-87	2,414,092	52,019,533	54,433,625
6-30-86	10,589,632	177,973,874	188,563,506
6-30-85	2,560,935	99,126,081	101,687,016

Actuarial Value of Assets as of June 30, 1989 is derived as follows:

1.	Market Value of Assets 6-30-89:		$2,798,932,658
2.	Five-Year Gains and Losses Not Yet Recognized:		
	80% of FY 89	161,534,492	
	60% of FY 88	(33,586,526)	
	40% of FY 87	21,773,450	
	20% of FY 86	37,712,701	
			$ 187,434,117
3.	20% of (1)		$ 559,786,532
4.	Actuarial Value of Assets 6-30-89: (1) - (2), within (1) +/- (3)		$2,611,498,541
	Estimated Rate of Return		9.35%

Table II-4

Historical Summary of System Assets
(dollars in billions)



1 = Actuarial Value 2 = Market Value

Section III

System Liabilities and Accounting Information

Section III
System Liabilities and Accounting Information

In this section we present values assigned to the liabilities of the System and then compare these liabilities to System assets. For this valuation liabilities were measured on two different bases:

Entry Age Normal Past Service Liability:

For purposes of comparing the results of this year's valuation with the prior year, a calculation was made of the June 30, 1989 System liabilities under the previous funding method (Entry Age Normal). A more detailed description of this method can be found in Appendix D.

Projected Unit Credit Past Service Liability:

As of June 30, 1989, the actuarial funding method used to determine system costs is based on the Projected Unit Credit method. This method is also used to determine the Projected Benefit Obligation (PBO) required by the Government Accounting Standards (GASB). A more detailed description of this method can be found in Appendix D.

The tables in this section present System liabilities as follows:

Table	Contents
III-1	Liabilities - Projected Unit Credit and Entry Age Normal
III-2	Accounting Information (GASB)
III-3	Historical Summary of System Liabilities

Table III-1

Liabilities - June 30, 1989
Projected Unit Credit and Entry Age Normal

		Projected Unit Credit	Entry Age Normal
1.	Liabilities for Retired Members	$2,078,455,209	$2,078,455,209
2.	Liabilities for Deferred Vested Members	10,673,793	10,673,793
3.	Total Inactive Liability	$2,089,129,002	$2,089,129,002
4.	Active Members Past Service Liability	2,982,390,546	3,702,831,955
5.	Total System Past Service Liability	$5,071,519,548	$5,791,960,957
6.	Actuarial Value of Assets	2,611,498,541	2,611,498,541
7.	Total System Unfunded Past Service Liability	$2,460,021,007	$3,180,462,416

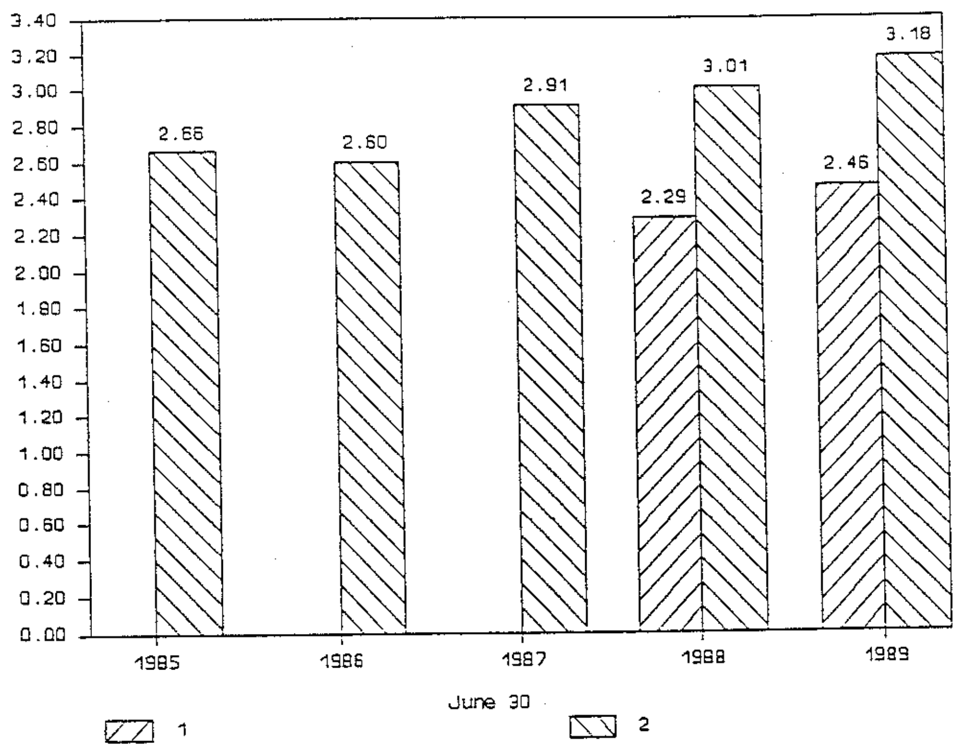
Table III-2

Accounting Information (GASB)

		June 30, 1989
1.	PBO for Retired Members	$2,078,455,209
2.	PBO for Deferred Vested Members	10,673,793
3.	Total Inactive PBO	$2,089,129,002
4.	PBO for Active Members	
	a. Accumulated Employee Contribution with Interest	$ 264,154,636
	b. Employer-Financed Vested Portion	2,351,656,985
	c. Employer-Financed Nonvested Portion	366,578,925
	d. Total Active PBO	$2,982,390,546
5.	Total System PBO	$5,071,519,548

Table III-3

Historical Summary of Unfunded System Past Service Liabilities
(dollars in billions)



1 = Projected Unit Credit 2 = Entry Age Normal

Section IV

System Contributions

Section IV
System Contributions

In this section we present the contributions required of the State in the upcoming fiscal year. Due to the timing of both the actuarial valuation process and the State's budget cycle, valuation results each June 30 must be projected to the following fiscal year in order to determine the State's required contribution.

For this year's valuation, the funding method has been changed to Projected Unit Credit, which is the basis for the costs shown in this section. In addition, two significant events have occurred after the valuation date (June 30, 1989) but before the end of the fiscal year which have been reflected in our cost development: (1) the benefit improvements resulting from collective bargaining, and (2) the "early retirement window" that went into effect in 1989.

In the following pages we present information on System contributions as follows:

Table	Contents
IV-1	Projected Unit Credit Normal Cost to 7-1-90
IV-2	Projected Unit Credit Unfunded Liability to 7-1-90
IV-3	Projected Unit Credit Total Costs to 7-1-90
IV-4	Comparison of Normal Cost Rates

Table IV-1

Projected Unit Credit Normal Cost Projections to July 1, 1990

	Plan	Normal Cost %	7-1-89 Earnings	7-1-89 Normal Cost	7-1-90 Projected Earnings
A.	Tier I				
	1. Hazardous Duty	19.0514	$89,777,004	$17,103,786	$92,829,422
	2. Plan B	10.9914	972,266,839	106,865,621	1,005,323,912
	3. Plan C	8.6174	102,160,098	8,803,556	105,633,541
	Total Tier I	11.4046	1,164,203,941	132,772,963	1,203,786,875
B.	Tier II				
	1. Hazardous Duty	9.3785	61,110,594	5,731,265	71,665,615
	2. All Others	4.3529	534,229,217	23,254,486	640,836,272
	Total Tier II	4.8688	595,339,811	28,985,751	712,501,887
C.	Grand Total	9.1932	$1,759,543,752	$161,758,714	$1,916,288,762

Normal Cost Projected to 7/1/90: 9.1932% x $1,916,288,762 = $176,168,626

Table IV-2

Projected Unit Credit Unfunded Liability to July 1, 1990

1.	Unfunded Actuarial Liability 7-1-89	$2,460,021,007
2.	One Year's Interest at 8½%	209,101,786
3.	Normal Cost	157,099,229
4.	Interest on Normal Cost	6,030,254
5.	Less State Payments	(291,352,627)
6.	Less Federal Payments	(50,015,844)
7.	Less Employee Contributions	(28,710,609)
8.	Less Interest on Contributions	(14,205,486)
9.	Unfunded Actuarial Liability 7-1-90	$2,447,967,710

Table IV-3

Projected Unit Credit Total Costs to July 1, 1990

1.	Unfunded Liability 7-1-90	$2,447,967,710	684,248,960 / EAN 3,132,216,670 78.15%
2.	Amortization Period	36 Years	
3.	Amortization Payment	$ 211,607,282	EAN 1.1739
4.	State Normal Cost	176,168,626	150,071,194
5.	Preliminary Total State Cost	$ 387,775,908	422,555,181 (34,779,273)
6.	Projected Payroll	$1,916,288,762	
7.	Preliminary Total State Cost %	20.24%	
8.	Adjustments (see Appendix E)		
	a. Benefit Improvements	$ 10,241,000	
	b. Early Retirement Window	0	
9.	Total Required State Contribution for Fiscal Year beginning 7-1-90	$ 398,016,908	

Table IV-4

Comparison of Normal Cost Rates

	Valuation Date July 1, 1989	Valuation Date July 1, 1988
PROJECTED UNIT CREDIT		
Tier I		
Hazardous Duty	19.05%	15.88%
Plan B	10.99	10.82
Plan C	8.62	9.95
Total Tier I	11.40%	11.22%
Tier II		
Hazardous Duty	9.38%	10.86%
All Others	4.35	4.36
Total Tier II	4.87	7.91
GRAND TOTAL (PUC)	9.19%	9.15%
ENTRY AGE NORMAL		
Tier I		
Hazardous Duty	17.93%	15.59%
Plan B	7.05	7.29
Plan C	6.90	7.18
Total Tier I	7.87%	8.05%
Tier II		
Hazardous Duty	14.68%	14.96%
All Others	6.98	7.11
Total Tier II	7.76%	7.91%
GRAND TOTAL (EAN)	7.84%	8.01%

Appendix A

Entry Age Normal Valuation Results

Appendix A
Entry Age Normal Valuation Results

		June 30, 1989	June 30, 1988
A.	**CURRENT RESULTS**		
1.	Present Value of Future Benefits		
	- Active Members	$5,327,647,771	$4,867,793,255
	- Retireds and Beneficiaries	2,078,455,209	1,867,349,142
	- Deferred Vested Members	10,673,793	10,265,675
	- Total Present Value	$7,416,776,773	$6,745,408,072
2.	Present Value Future Normal Cost Contributions	$1,624,815,816	$1,516,952,265
3.	Total Actuarial Liability	5,791,960,957	5,228,455,807
4.	Actuarial Value of Assets	2,611,498,541	2,189,510,979
5.	Unfunded Actuarial Liability	3,180,462,416	3,038,944,828
6.	Total Normal Cost	160,100,956	151,259,842
7.	Expected Employee Contributions	28,071,664	29,868,267
8.	State Normal Cost	132,029,292	121,391,575
B.	**PROJECTIONS TO FOLLOWING YEAR**		
1.	State Normal Cost	$ 150,071,194	$ 137,531,541
2.	Unfunded Actuarial Liability	3,132,216,670	3,007,478,846
3.	Total Cost*	422,555,181	396,368,471
4.	Total Cost as a Percent of Pay	22.05%	23.07%

* Does not reflect adjustment for Arbitrator's Award, Early Retirement Incentives or Shortfall in State's contribution for Fiscal Year 89/90.

Appendix B

Summary Statistics on System Membership

Appendix B
Summary Statistics on System Membership

Table of Contents

		Page
A.	Summary of Active Membership Data	B-1
B.	Summary of Retired Membership Data	B-3
C.	Analysis of Active Membership and Salary by Age and Service	B-4
D.	Analysis of Retired Membership and Benefits by Age and Year of Retirement	B-9

Summary of Active Membership Data

We received data on a total of 56,400 members, including employees of State Aided Institutions. Of the active records submitted to us, 118 (.2%) were rejected due to missing or invalid dates of birth and/or hire. Cost calculations were not revised to reflect these records. The following analysis compares this data with the July 1, 1988 data (see Exhibit B-3 for distribution by age and service).

	7-1-89	7-1-88	Change	Per Cent Change
Total Employees	56,202	55,568	+ 634	+ 1.1%
Total Earnings (millions)	$1,759.5	$1,583.0	+176.5	+11.1%
Average Earnings	$31,307	$28,487	+2,820	+ 9.9%

Earnings figures as of July 1 are actual amounts paid during the previous July 1 to June 30 period, adjusted for negotiated increases and merit adjustments effective through and including July 1; new entrant earnings are annualized.

These figures are broken down by Plan in the following exhibit.

Summary of Active Membership Data (continued)

Number of Members	7-1-89	7-1-88	Change	Per Cent Change
Tier I State Police	2,119	2,705	-586	-21.7%
Tier I Plan B	25,882	26,981	-1,099	- 4.1%
Tier I Plan C	3,186	3,632	-446	-12.3%
Tier II Hazardous Duty	2,050	1,746	+304	+17.4%
Tier II Others	22,965	20,504	+2,461	+12.0%

31,187
25,015
56,202 45%

Total Annual Compensation (millions)	7-1-89	7-1-88	Change	Per Cent Change
Tier I State Police	89.8	105.0	-15.2	-14.5%
Tier I Plan B	972.2	907.2	+65.0	+ 7.2%
Tier I Plan C	102.2	106.1	-3.9	- 3.7%
Tier II Hazardous Duty	61.1	47.2	+13.9	+29.4%
Tier II Others	534.2	417.5	+116.7	+28.0%

Average Compensation	7-1-89	7-1-88	Change	Per Cent Change
Tier I State Police	42,368	38,812	+3,556	+ 9.2%
Tier I Plan B	37,565	33,623	+3,942	+11.7%
Tier I Plan C	32,065	29,219	+2,846	+ 9.7%
Tier II Hazardous Duty	29,810	27,038	+2,772	+10.3%
Tier II Others	23,263	20,391	+2,872	+14.1%

Average Age	7-1-89	7-1-88	Change	Per Cent Change
Tier I State Police	41.6	41.2	+.4	+ 1.0%
Tier I Plan B	45.3	44.6	+.7	+ 1.6%
Tier I Plan C	54.3	54.2	+.1	+ 0.2%
Tier II Hazardous Duty	31.5	31.2	+.3	+ 1.0%
Tier II Others	36.1	35.4	+.7	+ 2.0%

Average Service	7-1-89	7-1-88	Change	Per Cent Change
Tier I State Police	14.0	13.0	+1.0	+ 7.7%
Tier I Plan B	14.6	13.6	+1.0	+ 7.4%
Tier I Plan C	15.8	15.1	+.7	+ 4.6%
Tier II Hazardous Duty	2.5	2.0	+.5	+25.0%
Tier II Others	3.0	2.3	+.7	+30.4%

Summary of Retired Membership Data

The following compares the current retired data with the June 30, 1988 data. See Exhibit B-4 for analysis of retirees by age, year of retirement, and type of retirement.

Retirees	7-1-89	7-1-88	Change	Per Cent Change
Number	21,137	20,265	+872	+ 4.3%
Total Annual Benefit*	203,855	182,868	+20,987	+11.5%
Average Monthly Benefit	9,644	9,024	+620	+ 6.9%
Terminated Vested				
Number	635	638	-3	- .5%

* (000 omitted)

Analysis by Age and Service - Tier I - Hazardous Duty

Active Members

YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	16	88	1	0	0	0	0	0	0	0	0	105
25 TO 29	36	237	96	3	0	0	0	0	0	0	0	372
30 TO 34	16	122	177	117	2	0	0	0	0	0	0	434
35 TO 39	14	70	81	216	87	5	0	0	0	0	0	473
40 TO 44	13	48	34	93	134	68	0	0	0	0	0	390
45 TO 49	8	27	12	31	48	45	1	0	0	0	0	172
50 TO 54	5	17	14	11	25	16	11	0	0	0	0	99
55 TO 59	0	9	11	2	5	6	13	6	0	0	0	52
60 TO 64	0	1	3	4	2	1	7	4	0	0	0	22
65 AND UP0	0	0	0	0	0	0	0	0	0	0		0
TOTALS	108	617	429	477	303	141	32	10	0	0	0	2,119

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	34,232	36,957	19,200	0	0	0	0	0	0	0	0	0
25 TO 29	35,454	38,832	40,133	44,860	0	0	0	0	0	0	0	36,373
30 TO 34	35,068	38,438	41,762	44,572	46,111	0	0	0	0	0	0	38,890
35 TO 39	32,737	37,405	42,326	45,309	44,666	48,414	0	0	0	0	0	41,358
40 TO 44	36,848	39,292	41,538	44,235	48,295	49,321	0	0	0	0	0	43,171
45 TO 49	37,891	38,084	41,638	45,385	45,814	49,365	45,355	0	0	0	0	45,427
50 TO 54	38,282	39,928	35,004	44,885	41,656	49,098	53,396	0	0	0	0	45,307
55 TO 59	0	41,550	41,016	50,672	45,505	40,087	52,451	52,541	0	0	0	43,720
60 TO 64	0	42,073	41,793	42,637	30,180	43,474	50,911	52,062	0	0	0	41,526
65 AND UP	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	35,343	38,403	41,191	44,911	46,132	48,843	52,217	52,349	0	0	0	42,368

Analysis by Age and Service - Plan B

Active Members

YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	1	27	0	0	0	0	0	0	0	0	0	28
25 TO 29	52	858	104	0	0	0	0	0	0	0	0	1,014
30 TO 34	150	1,597	1,303	78	0	0	0	0	0	0	0	3,128
35 TO 39	148	1,208	1,990	847	68	0	0	0	0	0	0	4,261
40 TO 44	105	958	1,403	1,249	734	56	0	0	0	0	0	4,505
45 TO 49	82	749	968	841	868	485	47	0	0	0	0	4,040
50 TO 54	55	545	758	598	664	483	367	33	0	0	0	3,503
55 TO 59	32	407	664	464	566	333	278	98	2	0	0	2,844
60 TO 64	26	264	426	309	404	206	169	74	30	0	0	1,908
65 AND UP	7	76	129	110	155	83	38	27	19	7	0	651
TOTALS	658	6,689	7,745	4,496	3,459	1,646	899	232	51	7	0	25,882

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	22,537	21,535	0	0	0	0	0	0	0	0	0	21,571
25 TO 29	22,660	26,802	25,708	0	0	0	0	0	0	0	0	26,477
30 TO 34	28,485	30,531	30,788	30,530	0	0	0	0	0	0	0	30,540
35 TO 39	32,935	33,152	36,338	36,509	35,141	0	0	0	0	0	0	35,331
40 TO 44	33,352	34,274	38,475	42,976	40,234	39,778	0	0	0	0	0	39,013
45 TO 49	37,082	34,109	36,299	42,582	45,741	41,973	37,082	0	0	0	0	39,936
50 TO 54	32,537	34,011	35,471	41,287	45,871	47,097	44,091	40,893	0	0	0	40,719
55 TO 59	33,059	31,878	35,815	39,209	43,813	47,295	49,390	45,952	33,378	0	0	40,385
60 TO 64	36,936	30,872	35,838	38,925	43,434	47,150	53,271	51,265	48,014	0	0	40,829
65 AND UP	33,917	29,494	34,855	38,701	42,249	45,078	44,040	60,663	52,089	61,007	0	40,323
TOTALS	31,817	31,794	35,462	40,472	43,647	45,283	47,087	48,639	48,958	61,007	0	37,565

Analysis by Age and Service - Plan C

Active Members

YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	2	0	0	0	0	0	0	0	0	0	2
25 TO 29	2	23	8	0	0	0	0	0	0	0	0	33
30 TO 34	5	58	69	8	0	0	0	0	0	0	0	140
35 TO 39	10	47	91	48	5	0	0	0	0	0	0	201
40 TO 44	8	68	70	71	38	0	0	0	0	0	0	255
45 TO 49	4	61	87	68	54	11	1	0	0	0	0	286
50 TO 54	14	88	118	80	59	25	34	6	0	0	0	424
55 TO 59	12	113	178	161	106	33	37	24	4	0	0	668
60 TO 64	13	91	213	163	133	28	24	26	14	5	0	710
65 AND UP	8	42	116	121	87	37	12	14	18	10	2	467
TOTALS	76	593	950	720	482	134	108	70	36	15	2	3,186

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	0	0	0	0	0	0	0	0	0	0	0	0
20 TO 24	0	29,158	0	0	0	0	0	0	0	0	0	29,158
25 TO 29	14,963	26,971	27,737	0	0	0	0	0	0	0	0	26,429
30 TO 34	22,987	28,974	27,168	32,986	0	0	0	0	0	0	0	28,099
35 TO 39	22,641	30,472	32,068	32,016	26,475	0	0	0	0	0	0	31,074
40 TO 44	34,868	29,711	31,117	32,999	31,284	0	0	0	0	0	0	31,408
45 TO 49	45,089	29,783	32,655	36,053	34,320	32,727	42,163	0	0	0	0	33,374
50 TO 54	30,979	28,769	28,891	36,494	35,790	41,939	35,002	28,739	0	0	0	32,586
55 TO 59	25,126	29,161	28,763	33,862	36,203	38,986	38,260	39,830	38,380	0	0	32,661
60 TO 64	28,621	29,863	28,593	30,358	32,607	34,968	37,950	45,932	31,934	41,308	0	31,272
65 AND UP	35,279	30,586	30,492	31,920	33,943	36,482	33,620	57,801	38,872	41,427	31,396	33,530
TOTALS	29,212	29,439	29,674	33,024	34,053	37,492	36,686	44,740	36,119	41,388	31,396	32,065

Analysis by Age and Service - Tier II - Hazardous Duty

Active Members

YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	3	0	0	0	0	0	0	0	0	0	0	3
20 TO 24	273	6	0	0	0	0	0	0	0	0	0	279
25 TO 29	711	61	0	0	0	0	0	0	0	0	0	772
30 TO 34	392	56	0	0	0	0	0	0	0	0	0	448
35 TO 39	192	33	2	1	0	0	0	0	0	0	0	228
40 TO 44	126	34	1	1	0	0	0	0	0	0	0	162
45 TO 49	72	11	1	1	0	0	0	0	0	0	0	85
50 TO 54	31	4	0	0	0	0	0	0	0	0	0	35
55 TO 59	23	5	1	0	0	1	0	0	0	0	0	30
60 TO 64	4	3	0	0	0	0	1	0	0	0	0	8
65 AND UP	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	1,827	213	5	3	0	1	1	0	0	0	0	2,050

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	20,919	0	0	0	0	0	0	0	0	0	0	20,919
20 TO 24	26,053	26,628	0	0	0	0	0	0	0	0	0	26,066
25 TO 29	29,647	34,073	0	0	0	0	0	0	0	0	0	29,997
30 TO 34	30,062	35,550	0	0	0	0	0	0	0	0	0	30,748
35 TO 39	29,783	35,581	32,672	30,626	0	0	0	0	0	0	0	30,651
40 TO 44	31,020	31,781	35,841	37,953	0	0	0	0	0	0	0	31,252
45 TO 49	31,346	30,272	27,202	36,078	0	0	0	0	0	0	0	31,214
50 TO 54	28,446	36,276	0	0	0	0	0	0	0	0	0	29,311
55 TO 59	28,622	26,971	43,853	0	0	30,509	0	0	0	0	0	28,918
60 TO 64	32,873	32,206	0	0	0	0	16,125	0	0	0	0	30,529
65 AND UP	0	0	0	0	0	0	0	0	0	0	0	0
TOTALS	29,334	33,771	34,448	34,886	0	30,509	16,125	0	0	0	0	29,810

Active Members

YEARS OF SERVICE

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	328	0	0	0	0	0	0	0	0	0	0	328
20 TO 24	2,790	116	0	0	0	0	0	0	0	0	0	2,906
25 TO 29	4,257	696	2	0	0	0	0	0	0	0	0	4,955
30 TO 34	3,256	696	9	0	0	0	0	0	0	0	0	3,961
35 TO 39	2,522	602	34	25	3	0	0	0	0	0	0	3,186
40 TO 44	2,154	559	39	44	24	0	0	0	0	0	0	2,820
45 TO 49	1,449	372	25	19	15	4	0	0	0	0	0	1,884
50 TO 54	956	261	10	19	7	0	0	0	0	0	0	1,253
55 TO 59	623	207	8	10	12	1	0	1	0	0	0	862
60 TO 64	353	150	4	2	4	0	0	1	0	0	0	514
65 AND UP	163	118	6	4	3	1	0	1	0	0	0	296
TOTALS	18,851	3,777	137	123	68	6	0	3	0	0	0	22,965

AVERAGE SALARIES

AGE	UNDER 5	5 TO 10	10 TO 15	15 TO 20	20 TO 25	25 TO 30	30 TO 35	35 TO 40	40 TO 45	45 TO 50	50 & UP	ALL YEARS
UNDER 20	3,666	0	0	0	0	0	0	0	0	0	0	3,666
20 TO 24	16,162	20,592	0	0	0	0	0	0	0	0	0	16,339
25 TO 29	23,261	25,853	19,188	0	0	0	0	0	0	0	0	23,624
30 TO 34	23,906	28,444	24,552	0	0	0	0	0	0	0	0	24,705
35 TO 39	24,778	28,615	27,028	31,191	33,556	0	0	0	0	0	0	25,586
40 TO 44	24,345	28,715	28,211	44,095	38,939	0	0	0	0	0	0	25,697
45 TO 49	23,912	27,676	36,398	43,520	40,591	31,811	0	0	0	0	0	25,169
50 TO 54	23,871	25,903	48,092	35,399	33,326	0	0	0	0	0	0	24,715
55 TO 59	21,923	27,388	27,763	32,358	31,651	16,239	0	52,357	0	0	0	23,575
60 TO 64	22,482	26,248	32,287	24,900	34,349	0	0	44,621	0	0	0	23,802
65 AND UP	16,478	21,781	24,660	42,049	39,563	16,125	0	4,483	0	0	0	19,296
TOTALS	22,271	27,188	30,428	38,707	36,960	26,601	0	33,820	0	0	0	23,263

RETIREMENT YEAR	NUMBER OF RETIREES: SERVICE	NUMBER OF RETIREES: DISABILITY SERVICE CONNECTED	NUMBER OF RETIREES: DISABILITY NON-SERVICE CONNECTED	NUMBER OF RETIREES: HAZARDOUS DUTY	AVERAGE BENEFIT: SERVICE	AVERAGE BENEFIT: DISABILITY SERVICE CONNECTED	AVERAGE BENEFIT: DISABILITY NON-SERVICE CONNECTED	AVERAGE BENEFIT: HAZARDOUS DUTY
PRE-1959	134	15	33	9	6,113	4,357	4,177	6,152
1959	53	3	5	5	6,095	4,880	5,128	8,402
1960	40	6	4	2	5,733	3,937	4,374	8,207
1961	47	3	7	3	6,646	6,022	4,645	7,540
1962	85	5	4		6,289	4,602	4,437	
1963	93	8	10	1	6,790	5,282	5,198	6,851
1964	97	11	9	1	5,881	6,690	5,116	7,911
1965	96	3	6	1	6,610	4,712	5,483	11,029
1966	127	10	18	1	6,402	4,815	5,054	2,194
1967	134	6	21		6,147	4,774	5,989	
1968	181	11	18	2	7,095	6,058	5,364	7,478
1969	296	12	22	1	7,636	6,357	6,692	6,859
1970	295	11	51	3	8,299	6,355	6,969	8,151
1971	443	16	61	6	8,836	7,089	6,726	11,554
1972	517	25	66	22	9,104	8,135	7,608	12,532
1973	618	27	70	21	9,288	9,790	8,004	14,244
1974	502	25	47	23	8,442	9,687	8,067	15,954
1975	779	47	68	20	9,062	9,088	7,547	17,415
1976	860	14	51	24	8,295	8,206	7,587	15,344
1977	687	11	27	13	7,990	6,421	7,361	14,401
1978	740	10	40	25	7,694	7,042	5,664	16,032
1979	1,410	11	40	42	8,122	8,229	6,330	16,097
1980	910	18	37	33	7,471	6,133	5,551	15,312
1981	746	21	36	52	8,286	6,935	5,935	15,563
1982	643	18	29	35	8,591	8,420	6,748	16,604
1983	657	15	38	43	9,883	8,700	7,944	17,693
1984	836	32	46	64	10,364	9,551	8,466	18,576
1985	937	35	38	68	11,056	8,939	9,644	19,331
1986	1,022	47	51	58	12,372	8,750	9,454	21,953
1987	1,002	36	47	81	13,463	10,165	9,544	22,199
1988	1,153	60	55	93	13,152	12,679	9,483	21,615
1989	683	2	11	65	13,874	41,880	9,152	22,345

AGE AT RETIREMENT	NUMBER OF RETIREES				AVERAGE BENEFIT			
		DISABILITY				DISABILITY		
	SERVICE	SERVICE CONNECTED	NON-SERVICE CONNECTED	HAZARDOUS DUTY	SERVICE	SERVICE CONNECTED	NON-SERVICE CONNECTED	HAZARDOUS DUTY
LESS THAN 40	31	15			12,046	7,270		
40 TO 44	2	51	19		10,638	12,684	8,230	
45 TO 49		62	45	46		10,958	10,456	22,373
50 TO 54	3	67	94	152	22,371	9,673	9,561	20,036
55 TO 59	840	91	153	178	15,302	8,161	8,909	19,408
60 TO 64	2,575	84	180	206	11,736	7,046	6,743	18,476
65 TO 69	4,113	68	181	132	10,215	5,930	6,212	16,577
70 TO 74	3,859	55	118	65	8,716	6,922	6,733	14,559
75 TO 79	2,771	37	115	23	8,357	8,073	7,179	11,213
80 TO 84	1,601	21	94	13	8,053	7,024	6,428	11,823
85 TO 89	761	5	41	2	7,180	4,567	5,491	7,466
90 TO 94	243	10			5,560		4,541	
95 TO 99	55	2	1		4,158	2,079	3,408	
FINAL TOTALS	16,823	574	1,066	817	9,624	8,605	7,349	18,233

Appendix C

Summary of Plan Provisions

Appendix C
Summary of Plan Provisions

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

Established September 1, 1939

Does not reflect Arbitrator's Award

1. Membership

Tier I [Sec. 5-160]: Each state employee appointed to classified service shall become a member on the first day of the pay period following permanent appointment.

Each officer elected by the people and each appointee of such officer exempt from classified service may elect to become a member, effective on the first day of the pay period following receipt of such election.

Each other state employee exempt from classified service shall become a member on the first day of the pay period following six months of employment.

Except as noted below employees hired prior to January 1, 1984 could elect (no later than January 2, 1984) to be covered under either Plan B or Plan C. Employees under contracts with Union Independent and CSEA unions hired prior to October 1, 1982 had until October 1, 1984 to make such election.

Tier II [Sec. 23]: Tier II consists of employees first joining the retirement system on or after January 1, 1984 plus employees hired between July 1, 1982 and January 1, 1984 who elected Tier II. Each state employee becomes a member on the first day of employment.

2. Normal Retirement Eligibility

State Police [Sec. 5-173 as amended by Sec. 17]: Age 47 and 20 years of service.

Tier I [Sec. 5-162]: Age 55 and 25 years of service, age 60 and 10 years of service, or age 70.

Tier II [Sec. 28 & 30]: Age 65 and 10 years of service or age 70 and 5 years of service, except hazardous duty members may retire after 25 years.

3. Normal Retirement Benefit

State Police [Sec. 5-173 as amended by Sec. 17]: 50% of Final Average Earnings plus 2% for each year in excess of 20.

Tier I Plan B [Sec. 5-162; 10]: Same as Plan C up to age 65; thereafter 1% of Final Average Earnings up to $4,800 plus 2% of Final Average Earnings in excess of $4,800 times years, reduced for retirement prior to age 65 with less than 25 years. Minimum benefit with 25 years, $300 per month.

Tier I Plan C [Sec. 5-162; 10]: 2% of Final Average Earnings times years of service, reduced for retirement prior to age 65 with less than 25 years. Minimum with 25 years, $300 per month.

Tier II Hazardous Duty Members [Sec. 30]: 2% of Final Average Earnings times years of service. Minimum with 25 years, $300 per month (or less if retirement before 7-1-87).

Tier II All Other [Sec. 28]: 1 1/3% of Final Average Earnings plus ½% of Final Average Earnings in excess of the year's breakpoint*, times years of service from 10-1-82. Minimum with 25 years, $300 per month (or less if retirement before 7-1-87).

* $10,700 increased by 6% each year after 1982, rounded to the nearest $100.

4. Early Retirement

State Police: None.

Tier I [Sec. 5-162]: Age 55 and 10 years of service; Normal Retirement Benefit reduced actuarially for retirement prior to age 60.

Tier II [Sec. 29]: Age 55 and 10 years of service; Normal Retirement Benefit reduced ½% for each month prior to age 65; Minimum benefit with 25 years, $300 per month (or less if retirement prior to 7-1-87).

5. Deferred Retirement

Tier I [Sec. 5-162]: May be deferred but not beyond age 70.

Tier II [Sec. 28 (b) and (e)]: May be deferred but not beyond age 70. Benefit is based on salary and service to actual retirement.

6. Vesting

Tier I [Sec. 5-166 as amended in part by Sec. 13]: Ten years of service; actuarially reduced benefit payable at age 55; in addition employees are always fully vested in their own contributions (after 1-1-83, Tier I, contributions with 5% interest from 1-1-82).

Tier I Hazardous Duty [Sec. 17]: As above, but may receive full benefits at age 47 if 20 years of service at termination.

Tier II [Sec. 31]: Ten years of service or age 70 and 5 years; benefit payable at age 65 or early retirement benefit payable at age 55; minimum benefit with 25 years, payable after age 55, $300 per month (or less if retirement before 7-1-87).

7. Member Contributions

Tier I State Police [Sec. 5-161]: 2% of earnings up to Social Security Taxable Wage Base plus 5% above that level.

Plan B [Sec. 5-161]: 2% of earnings up to Social Security Taxable Wage Base plus 5% above that level.

Plan C [Sec. 5-161]: 5% of earnings.

Tier II [Sec. 37]: None.

8. Cost of Living

[Sec. 5-162b, 5-162d, Sec. 9 & Sec. 35]: Annual adjustment each July 1 of up to 5% for retirements prior to 7-1-80; 3% for retirements after 7-1-80. For members (or beneficiaries) not covered by Social Security and age 62 and over, the maximum increase is 6%. If an actuarial surplus (as defined in the law) exists, the commission may further increase retired benefits.

9. Death Benefits

State Police [Sec. 5-146]: Survivor benefits to spouse of $550 per month plus $250 to a surviving dependent child (or $575 to surviving dependent children).

Tier I [Sec. 5-165a as amended by Sec. 12]: If eligible for early or normal retirement, spouse benefit equal to 50% of average of Life Benefit and 50% J&S benefit member would have received. If not eligible to retire but 25 years, same benefit calculated as though age 55 using service and earnings at death.

[Sec. 5-168 as amended by Sec. 13]: If not eligible for retirement, return of contributions (after 10-1-82, Tier I, with interest from 1-1-82 at 5%).

Tier II [Sec. 34]: If eligible for early or normal retirement, spouse benefit equal to 50% of member's benefit under a 50% J&S. If not eligible to retire but 25 years, same benefit calculated as though age 55 using service and earnings at death.

[Sec. 36]: If death is due to employment, a spouse with dependent child(ren) under 18 will be paid $7,500 in not less than 60 installments while living and not remarried; also $20 per month per child under 18. If no children under 18, spouse [or dependent parent(s), if no spouse] will be paid $4,000 in not less than 60 installments.

10. Disability Benefits

Tier I [Sec. 16]: For non-service disabilities occurring prior to age 60 and after 5 years of service, benefit equals 3% times base salary times years of service (Maximum 1 2/3% times service to 65). If disability occurs prior to age 60 and is due to service, benefit equals 1 2/3% of salary times service projected to 65 (maximum 30 years) and is payable regardless of length of service. Exception: State Police benefit is accrued benefit.

Maximum disability benefit is lesser of: 100% of salary less Workers Compensation and Social Security and less non-rehabilitation earnings or 80% of salary less Workers Compensation and Social Security. Social Security is primary plus family.

Tier II [Sec. 32]: Prior to age 65 and due to service or after 10 years of service, benefit is 1 1/3% of final average earnings, plus ½% of excess earnings times service projected to 65 (maximum 30 years or service to Date of Disability if greater than 30 years). Same maximum as Tier I.

11. Optional Forms of Payment

Tier I [Sec. 11]: 50% Qualified Joint and Survivor (CA)[1].

Tier II [Sec. 33]: 50% or 100% Joint and Survivor (CA). Ten years certain and life. Twenty years certain and life. Life[2].

12. Part-Time Employment

[Sec. 5-162g & Sec. 27]: Service treated as if full-time for eligibility. If consistent part-time for all periods, treat as full-time. If varying schedule or some part-time, some full-time, service and salary proportionately adjusted.

[1] Normal Form if married at least 12 months.
[2] Normal Form if not married at least 12 months.

Appendix D

Actuarial Methods and Assumptions

Appendix D
Actuarial Method and Assumptions

A. Funding Method

1. Through the 1988 valuation, the actuarial valuation method used in the cost calculations was the Entry Age Normal Cost Method. As of July 1, 1989 the actuarial valuation method used is the Projected Unit Credit Cost Method. Recommended annual contributions until the accrued liability is completely funded will consist of two pieces: Normal (or Current) Cost plus a payment towards the Unfunded Accrued Liability.

2. Under the Entry Age Normal Method:

   a. The Normal Cost is determined by calculating the present value of future benefits for present active Members that will become payable as the result of death, disability, retirement or termination. This cost is then spread as a level percentage of earnings from entry age to termination as an Active Member.

   b. If Normal Costs had been paid at this level for all prior years, a fund would have been accumulated. Because this fund represents the portion of benefits that would have been funded to date, it is termed the Accrued Liability. In fact, it is calculated by adding the present value of benefits for retired Members and Terminated Vested Members to the present value of benefits for active Members and subtracting the present value of future contributions.

3. Under the Projected Unit Credit Cost Method:

   a. The Accrued Liability is determined directly as the present value of benefits accrued to date, where the accrued benefits for each Member is the pro-rata portion (based on service to date) of the <u>projected</u> benefit payable at death, disability, retirement or termination.

   b. The Current Cost is then similarly determined as the present value of the portion of the <u>projected</u> benefit attributable to the current year.

4. The Unfunded Accrued Liability is the Accrued Liability less Current Assets.

5. Since both valuations were done as of June 30, 1989, costs have been projected to July 1, 1990 in order to correspond to the fiscal year as follows:

   a. Normal Costs, both Entry Age Normal and Projected Unit Credit, were determined as a percentage of earnings, by Tier, as of July 1, 1989. Earnings were projected to July 1, 1990, separately for each Tier because of the shifting Tier populations, and the projected earnings were then multiplied by the normal cost factors, by Tier.

b. The Unfunded Accrued Liability was determined as of June 30, 1989, and brought forward to June 30, 1990 by adding the Normal Cost plus interest and subtracting expected employee, State, and Federal contributions, also with interest. This amount was amortized over the 36 years remaining in the original 40 year amortization period.

c. Normal Cost and Past Service Amortization payments were adjusted to reflect payment in twelve equal installments at the end of each month.

B. Actuarial Assumptions

Mortality: 1983 Group Annuity Mortality Table with ages set back 4 years for females.

Investment Return: 8½%.

Salary Scale:

Age	Annual Rate of Increase
20	10.2%
25	9.2
30	8.1
35	7.1
40	6.5
45	6.0
50	6.0
55	6.0
60	6.0

Disability:

Age	Annual Rate of Disability (Per 1000 lives)
20	0.75
25	0.85
30	0.97
35	1.21
40	1.70
45	2.79
50	5.09
55	9.25
60	14.42

Service connected disabilities are assumed to comprise 50% of total Disability for Hazardous Duty employees and 20% for all other employees.

Social Security Wage Base Increases:
3½% compounded annually.

B. Actuarial Assumptions (cont'd)

Retirement Ages:

Hazardous Duty:

Age	First Year Eligible	Thereafter
47-50	50%	10%
51	48	10
52	46	10
53	44	10
54	42	10
55	40	10
56	38	10
57	36	10
58	34	10
59	30	10
60	50	30
61	50	30
62-70	100	100

All Others:

Age	First Year Eligible	Thereafter
55-60	20%	5%
61	40	5
62	40	30
63	40	30
64	60	30
65	80	60
66	80	60
67	80	60
68	80	60
69	80	60
70	100	100

B. Actuarial Assumptions (cont'd)

Turnover:

Five year select and ultimate rates as shown in the Turnover Table below for non-hazardous duty males; the same table with rates increased 10% for females; the same table with rates reduced 50% for hazardous duty.

Turnover Table

Years of Participation

Age	0	1	2	3	4	5 & Over
20	50%	45%	30%	25%	20%	15%
25	45	35	30	25	20	10
30	40	30	25	20	15	8
35	35	28	20	15	10	6
40	30	20	10	8	6	4
45	20	10	8	6	4	2
50	10	8	6	4	2	0
55	10	7	5	2	0	0
60	10	0	0	0	0	0

Cost of Living Increases:

3% per year for retirees on or after 1-1-80.
4½% per year for retirees prior to 1-1-80.

Asset Valuation:

Adjusted market value: assets are written up (or down) by spreading recognition of gains and losses over five years, plus an additional write-up (or write-down) as necessary so that the final adjusted value is within 20% of market value.

Appendix E

Cost Adjustments: Re: Arbitrator's Decision

Includes only those issues having a more than minimal impact on the Trust Fund.

Appendix E
Cost Adjustments Re: Arbitrator's Decision

The recently completed pension negotiations between the State of Connecticut and the State Employees Bargaining Agent Coalition resulted in several changes to the provisions of the Connecticut State Employees Retirement System. Although these changes occurred after the valuation date (June 30, 1989), they are properly reflected in the contribution for the following fiscal year. However, issues 11 and 12 of the negotiations are not effective until after Fiscal Year 1990, and so are not included herein.

Shown below is the increase in contribution due to those issues for which the cost impact is other than minimal:

Issue	Increase in Contribution	
4	$ 90,000	52,000
9	1,121,000	363,000
11/12 3.3	NA	
15	2,150,000	1,150,000
22	3,300,000	3,300,000
25	292,000	100,000
27	360,000	198,000
31	1,319,000	750,000
39.2 913,000	943,000	488,000
48	54,000	29,000
74	400,000	300,000
76	150,000	30,000
79	92,000	40,000
	$10,241,000	6,662,000

Details regarding the individual issues are presented on the following pages. These results were originally published in our October 3, 1989 report to the Retirement Commission.

(S in millions)

<u>Issue</u>

4 Five year REA Bridge, or length of service (whichever is greater)

<u>Prevailing Party</u> Agreed

<u>Employer Costs</u>

FY 90/91	PUC	EAN
Normal Cost	.038	.033
Past Service Cost	.052	.067
Total	.090	.100

<u>Comments</u>

In the future the entry age normal cost is expected to increase in proportion to Total System payroll increases. The projected unit credit normal cost is expected to increase at a slightly faster rate.

The past service cost will remain level and then cease after 36 years.

<u>Issue</u>

9 Eliminate Tier II Social Security Offset
-- Limit offset to 35 year average of Social Security covered earnings
-- Change formula to 1 and 5/8% for years beyond 35 years

<u>Prevailing Party</u> State

<u>Employer Costs</u>

FY 90/91	PUC	EAN
Normal Cost	.758	1.167
Past Service Cost	.363	.501
Total	1.121	1.668

<u>Comments</u>

In the future the entry age normal cost is expected to increase in proportion to Tier II payroll increases (since all new entrants join Tier II, the Tier II payroll is growing by a greater rate than Total System Payroll).

The projected unit credit normal cost is expected to increase at a greater rate than the entry age normal cost.

The past service cost will remain level and then cease after 36 years.

Issues 11, 12

Note: Since issues 11 and 12 each result in a cost impact dependent on the other issue, the analysis is presented here for both issues combined.

11: Change Tier II Normal Retirement Age to 62 and 5 years of service, or 60 with 25 years

12: Reduce the early retirement benefit reduction factor from 6% to 3%

Prevailing Party SEBAC (for 11 and 12)

Employer Costs

PUC

FY 90/91	11	12	combined 11 & 12
Normal Cost	1.700	1.400	2.500
Past Service Cost	.500	.400	.800
Total	2.200	1.800	3.300

EAN

FY 90/91	11	12	combined 11 & 12
Normal Cost	2.300	1.800	3.400
Past Service Cost	1.000	0.800	1.500
Total	3.300	2.600	4.900

Comments

In the future the entry age normal cost is expected to increase in proportion to Tier II payroll increases (since all new entrants join Tier II, the Tier II payroll is growing by a greater rate than Total System Payroll).

The projected unit credit normal cost is expected to increase at a greater rate than the entry age normal cost.

The past service cost will remain level and then cease after 36 years.

Issue 15

Credit Tier II Service for those employed prior to 10/1/82 who chose not to be covered by Retirement System

Prevailing Party: Analysis assumes SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	1.000	0.900
Past Service Cost	1.150	1.250
Total	2.150	2.150

Comments

In the future, the entry age normal cost shown above will change in proportion to the total payrolls of system members who chose not to be covered by the Retirement System (e.g., as these members continue to work and receive pay increases, the normal cost will increase, as these members withdraw, retire, etc. from active service the normal cost will decline, and eventually cease.)

The projected unit credit costs will increase at a greater rate than the entry age normal cost.

The past service cost will remain level and then cease after 36 years.

Issue 22

Allow one-time spousal option change for current beneficiaries and provide medical benefits for surviving spouses/dependents under 18.

Prevailing Party: SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	0.000	0.000
Past Service Cost	3.300	3.300
Total	3.300	3.300

Comments

The past service costs shown above remain level until the unfunded past service liability is fully amortized (36 years). The estimate is based on a highly uncertain assumption that 50% of current retirees eligible to make an option change will do so. If, for example, only 10% elect an option change the figures above reduce to $0.660.

Issue
25 Minimum Disability Coverage (60% of salary)

Prevailing Party SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	0.132	0.118
Past Service Cost	0.160	0.207
Total	0.292	0.325

Comments

In the future the entry age normal cost is expected to increase in proportion to Total System payroll increases. The projected unit credit normal cost is expected to increase at a slightly faster rate.

The past service cost will remain level and then cease after 36 years.

Issue
27 Retiree under a disability pension would be able to receive a full pension plus workers' compensation for the eligible period

Prevailing Party SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	0.162	0.145
Past Service Cost	0.198	0.255
Total	0.360	0.400

Comments

In the future the entry age normal cost is expected to increase in proportion to Total System payroll increases. The projected unit credit normal cost is expected to increase at a slightly faster rate.

The past service cost will remain level and then cease after 36 years.

Please note that this cost estimate is very sensitive to the actual percentage of service connected disabilities who receive benefits under Section 5-142. As a result, it is possible that these costs are overstated.

Issue
31 — 130% CAP on earnings which can be used to calculate retirement benefits

Prevailing Party — SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	.569	.473
Past Service Cost	.750	1.027
Total	1.319	1.500

Comments — In the future the entry age normal cost is expected to increase in proportion to Total System payroll increases. The projected unit credit normal cost is expected to increase at a faster rate than the entry age normal cost.

The past service cost will remain level and then cease after 36 years.

Issue
39.2 — Hazardous Duty Classifications for Current Firefighters and Police Officers

Prevailing Party — SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	.425	.471
Past Service Cost	.488	.529
Total	.913	1.000

Comments — In the future the entry age normal cost is expected to increase in proportion to Hazardous Duty payroll increases. The projected unit credit normal cost is expected to increase at a faster rate than the entry age normal cost.

The past service cost will remain level and then cease after 36 years.

Issue
48

Reduce "Buy-In" Rate for Municipal Police Officers who join state service and allow purchase to be counted as hazardous duty

Prevailing Party SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	.025	.028
Past Service Cost	.029	.032
Total	.054	.060

Comments

In the future the entry age normal cost is expected to increase in proportion to Hazardous Duty payroll increases. The projected unit credit normal cost is expected to increase at a slightly faster rate.

The past service cost will remain level and then cease after 36 years.

Issue
74

Tier I Hazardous Duty Employee Contributions Increased from 2%-4%. Tier II employee contributions increased from 0 to 4% (below social security wages) to Allow for 20 years and out in both Tiers I and II. Increase Tier II benefit to 2.5%

Prevailing Party SEBAC

Employer Costs

FY 90/91	PUC	EAN
Normal Cost	.100	.500
Past Service Cost	.300	.600
Total	.400	1.100

Comments

In the future the entry age normal cost is expected to increase in proportion to Tier II Hazardous Duty payroll increases. Since all new hazardous duty hires join Tier II, this cost will increase at a greater rate than future Total System payroll increases. The projected unit credit normal cost is expected to increase at a greater rate than the entry age normal cost.

The past service cost will remain level and then cease after 36 years.