Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

January 19, 2017

Ms. Brenda Halpin, Director
State of Connecticut
Office of the State Comptroller
Retirement Services Division
55 Elm Street
Hartford, CT 06106

Dear Ms. Halpin:

Enclosed is the "Connecticut State Employees Retirement System Report of the Actuary on the Valuation Prepared as of June 30, 2016".

Please let us know if there are any questions concerning the report.

Sincerely yours,

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

Edward J. Koebel, FCA, MAAA, EA
Principal and Consulting Actuary

JJG/EAK:kc

Enc.

S:\2016\Connecticut SERS\Pension\Valuation\CT SERS 6-30-2016 Valuation Report.doc

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144
Phone (678) 388-1700 • Fax (678) 388-1730
www.CavMacConsulting.com
Offices in Englewood, CO • Kennesaw, GA • Bellevue, NE

Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM

REPORT OF THE ACTUARY ON THE VALUATION PREPARED AS OF JUNE 30, 2016

www.CavMacConsulting.com

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

January 19, 2017

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

Members of the Commission:

Connecticut General Statutes Section 5-155a governs the operation of the Connecticut State Employees Retirement System (SERS). The actuary makes periodic valuations of the contingent assets and liabilities of the Retirement System at the direction of the Commission. We are pleased to submit the report giving the results of the actuarial valuation of the Retirement System prepared as of June 30, 2016.

The purpose of the report is to provide a summary of the funded status of SERS as of June 30, 2016 and to recommend rates of actuarially determined contributions rates for the fiscal year ending June 20, 2018 and June 30, 2019. The report indicates that annual actuarially determined employer contribution at the rate of 44.31% of compensation for the fiscal year ending June 30, 2018 and 47.26% of compensation for the fiscal year ending June 30, 2019 is sufficient to support the benefits of the System.

Since the previous valuation, the actuarial assumptions and methods have been changed to reflect the latest experience investigation for the five-year period ending June 30, 2015 and the December 8, 2016 agreement between the State and the State Employees Bargaining Agent Coalition (SEBAC). In preparing the valuation, the actuary relied on data provided by the Comptroller's Office. While not verifying data at the source, the actuary performed tests for consistency and reasonableness.

The System is funded on an actuarial reserve basis. The actuarial assumptions recommended by the actuary and adopted by the Commission are reasonably related to the experience under the System and to reasonable expectations of anticipated experience under the System. The funding objective of the System is that contribution amounts will be sufficient to fully fund the liabilities of System over a reasonable funding period. The funding method determines the unfunded actuarial accrued liability (UAAL) as the excess of actuarial accrued liability over the actuarial value of assets. The UAAL is allocated to 1) the portion attributable the unfunded accrued liability as of 1984 (called the Statutory UAAL base) and 2) the remainder of the UAAL which is called the 2016 UAAL base. The Statutory UAAL base is amortized over the 40-year period beginning 1992 while the 2016 UAAL base is amortized over a closed 30-year period beginning 2016. As of June 30, 2016, the weighted average amortization period is 25.1 years.

This is to certify that the valuation was prepared in accordance with principles of practice prescribed by the Actuarial Standards Board, and that the actuarial calculations were performed by qualified actuaries in accordance with accepted actuarial procedures, based on the current provisions of the retirement system and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the System.

3550 Busbee Pkwy, Suite 250, Kennesaw, GA 30144
Phone (678) 388-1700 • Fax (678) 388-1730
www.CavMacConsulting.com
Offices in Englewood, CO • Kennesaw, GA • Bellevue, NE

Future actuarial results may differ significantly from the current results presented in this report due to such factors as the following: plan experience differing from that anticipated by the economic or demographic assumptions; changes in economic or demographic assumptions; increases or decreases expected as part of the natural operation of the methodology used for these measurements (such as the end of an amortization period or additional cost or contribution requirements based on the plan's funded status); and changes in plan provisions or applicable law. Since the potential impact of such factors is outside the scope of a normal actuarial valuation, an analysis of the range of results is not presented herein.

The actuarial computations presented in this report are for purposes of determining the recommended funding amounts for the System. Use of these computations for purposes other than meeting these requirements may not be appropriate.

The undersigned meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Sincerely yours,

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

Edward J. Koebel, FCA, MAAA, EA
Principal and Consulting Actuary

JJG/EJK:kc

TABLE OF CONTENTS

CONNECTICUT STATE EMPLOYEES RETIREMENT SYSTEM
REPORT OF THE ACTUARY
ON THE VALUATION
PREPARED AS OF JUNE 30, 2016

SECTION I - SUMMARY OF PRINCIPAL RESULTS

1. For convenience of reference, the principal results of the current and preceding valuations are summarized below:

Valuation Date	June 30, 2016	June 30, 2014
Number of active members	50,019	49,976
Annual compensation	$ 3,720,751,429	$ 3,487,576,617
Retired members and beneficiaries:		
Number	48,191	45,803
Annual allowances	$ 1,745,785,103	$ 1,576,606,022
Deferred Vested Members:		
Number	1,412	1,457
Annual allowances	$ 20,316,080	$ 20,956,362
Assets:		
Market Value	$ 10,636,702,645	$ 10,472,567,077
Actuarial Value	$ 11,922,965,860	$ 10,584,795,257
Unfunded actuarial accrued liability	$ 21,693,750,225	$ 14,920,814,520
Single Equivalent Amortization period (years)	25.1	17.0
Funded Ratio based on Actuarial Assets	35.5%	41.5%
Funded Ratio based on Market Assets	31.6%	41.1%
For Fiscal Year Ending	**June 30, 2018**	**June 30, 2016**
Actuarially Determined Employer Contribution (ADEC):		
Normal	$ 365,570,268	$ 278,812,817
Accrued liability	1,282,836,995	1,235,654,507
Total	$ 1,648,407,263	$ 1,514,467,324
Actuarially Determined Employer Contribution Rate (ADEC):		
Normal	9.83%	7.99%
Accrued liability	34.48%	35.43%
Total	44.31%	43.42%

2. All amounts shown that are prior to June 30, 2010 were developed and/or reported by the prior actuarial firm. The results of the valuation are given in Schedule A.

3. Comments on the valuation results are given in Section IV, comments on the experience and actuarial gains and losses during the valuation year are given in Section VII and the rates of contribution payable by employers are given in Section V.

4. Schedule B of this report presents the development of the actuarial value of assets.

5. Schedule D details the actuarial assumptions and methods employed. Since the last valuation, changes to the demographic assumptions include changes to the rates of withdraws, disability retirement, service retirement and mortality. The analysis and basis for these changes are included in the latest Experience Investigation for the five-year period ending June 30, 2015. Further, economic assumptions (assumed rates of inflation and investment return), the actuarial cost method, and the UAAL amortization methodology were changed in accordance with the Memorandum of Agreement (MOU) between the State and SEBAC effective December 8, 2016.

6. Schedule F gives a summary of the benefit and contribution provisions of the plan. There were no changes to the plan provisions since the last valuation.

7. The Governmental Accounting Standards Board issued Statement No. 67 (GASB 67) in June 2012 and is effective for plan years beginning after June 15, 2013. GASB 67 replaced GASB 25 for plans and a separate GASB 67 report will be prepared for the Commission. We have provided some supplemental disclosure information and tables in Section VI.

8. As shown in the Summary of Principal Results, the funding ratio is the ratio of the actuarial value of assets to the accrued liability. The funded ratio is an indication of progress in funding the promised benefits using a long-term, stable funding approach. Since the ratio is less than 100%, there is a need for contributions in addition to the plan's normal cost. The funded ratio based on the market value of assets is also provided for informational purposes.

Connecticut State Employees Retirement System

Comparative Schedule*

	Active Members				Retired Lives				Valuation Results ($ thousands)		
Valuation Date June 30	Number	Payroll ($ thousands)	Average Salary	% increase from previous valuation	Number	Active/ Retired Ratio	Annual Benefits ($ thousands)	Benefits as % of Payroll	Accrued Liability	Valuation Assets	UAAL
2008	53,196	$3,497,445	$65,746	4.1	38,093	1.4	$1,047,479	29.9%	$19,243,343	$9,990,247	$9,253,126
2010	50,064	3,295,666	65,829	0.1	41,782	1.2	1,264,025	38.4	21,054,197	9,349,605	11,704,592
2011	47,778	3,210,666	67,200	2.1	44,051	1.1	1,391,091	43.3	21,216,725	10,122,765	11,003,960
2012	47,868	3,354,682	70,082	4.3	43,887	1.1	1,424,477	42.5	23,018,752	9,744,986	13,273,766
2014	49,976	3,487,577	69,785	(0.4)	45,803	1.1	1,576,606	45.2	25,505,610	10,584,795	14,920,815
2016	50,019	3,720,751	74,387	6.6	48,191	1.0	1,745,785	46.9	33,616,716	11,922,966	21,693,750

*All amounts prior to 2010 reported by prior actuarial firm.

SECTION II - MEMBERSHIP

Data regarding the membership of the System for use as a basis for the valuation were furnished by the Comptroller's office. The following tables summarize the membership of the Retirement System as of June 30, 2016 upon which the valuation was based. Detailed tabulations of the data are given in Schedule G.

Active Members

			Group Averages		
Group	Number	Payroll	Salary	Age*	Service*
Tier I – Hazardous	35	$3,867,315	$110,495	58.7	31.9
Tier I – Plan B	1,428	140,292,521	98,244	59.5	34.6
Tier I – Plan C	45	4,067,185	90,382	61.1	34.4
Tier II – Hazardous	1,512	153,262,541	101,364	51.0	22.5
Tier II – Others	11,204	995,351,864	88,839	54.9	24.9
Tier IIA – Hazardous	5,957	489,700,682	82,206	44.0	12.5
Tier IIA – Others	16,063	1,141,771,811	71,081	48.4	11.3
Tier III – Hazardous	2,551	156,526,887	61,359	34.4	2.5
Tier III – Hybrid Plan	2,087	187,238,827	89,717	50.4	12.7
Tier III – Others	9,137	448,671,796	49,105	38.7	2.3
Total	50,019	$3,720,751,429	$74,387	47.3	13.5

*Years

Of the 50,019 active members, 36,320 are vested and 13,699 are non-vested.

Retired Lives

			Group Averages	
Type of Benefit Payment	No.	Annual Benefits	Benefit	Age*
Retired – Pre 1980	966	$17,718,533	$18,342	89.8
Retired – 1980 - 1997	12,048	393,601,362	32,669	81.1
Retired – 1997 - 2011	24,358	944,154,694	38,762	68.1
Retired – 2011+	10,819	390,310,514	36,076	61.0
Total	48,191	$1,745,785,103	$36,226	70.2

*Years

This valuation also includes 1,412 deferred vested members with estimated annual benefits of $20,316,080.

SECTION III - ASSETS

1. As of June 30, 2016, the total market value of assets amounted to $10,636,702,645 as reported by the Comptroller's Office. This amount includes $15,989,968 of receivables as of the valuation date. The estimated investment return for the two plan years since the last valuation were 3.43% and (0.16%), respectively. Schedule C shows receipts and disbursements of the System for the two years preceding the valuation date and a reconciliation of the fund balances at market value.

2. The actuarial value of assets used for the current valuation was $11,922,965,860. The estimated investment return for the two plan years on an actuarial value of assets basis was 8.46% and 5.30%, respectively, which can be compared to the investment return assumed over the two-year period of 8.00% (the change in assumed investment rate of return applies to year following June 30, 2016). Schedule B shows the development of the actuarial value of assets as of June 30, 2016.

3. Schedule C shows receipts and disbursements of the System for the two years preceding the valuation date and a reconciliation of the fund balances at market value.

SECTION IV – COMMENTS ON VALUATION

1. Schedule A of this report outlines the results of the valuation of the Retirement System as of June 30, 2016. The valuation was prepared in accordance with the actuarial assumptions and methods set forth in Schedule D and the actuarial cost method which is described in Schedule E.

2. The valuation shows that the System has a total actuarial accrued liability of $33,616,716,085, of which $22,931,601,402 is for the benefits payable on account of present retired members, beneficiaries of deceased members, and inactive members entitled to deferred vested benefits, and $10,685,114,683 is for the benefits expected to be payable on account of present active members, based on service to the valuation date. Against these liabilities, the System has total present assets for valuation purposes of $11,922,965,860 as of June 30, 2016. When this amount is deducted from

the actuarial accrued liability of $33,616,716,085, there remains $21,693,750,225 as the unfunded actuarial accrued liability (UAAL).

3. The December 8, 2016 MOU between the State and SEBAC contains several changes to the funding methods and assumptions used in developing valuation results. First, the actuarial cost method utilized in the valuation is the Entry Age Normal cost method. This cost method is used to determine the annual normal cost contribution for active members as well as the determination of the unfunded actuarial accrued liability. Second, the amortization of the UAAL is reset to separately amortize the portion attributable to the unfunded liability as of 1984 (Statutory UAAL base) over the period ending June 30, 2032 and the remaining UAAL (2016 UAAL base) which is funded over a 30-year period ending June 30, 2047. Future actuarial gains and losses will be amortized over closed 25-year periods beginning the year each separate base is established. Finally, the MOU change the amortization method from a level percentage of payroll amortization method to a level dollar method to be phased in over a 5 year period. These changes, in addition to the change in the assumed rate of inflation (from 2.75% to 2.50%) and the change in the assumed rate of investment return (from 8.00% to 6.90%) are expected to markedly enhance the stability of valuation results in future years.

4. The employer's contributions to the System consist of normal cost contributions and accrued liability contributions. The normal cost, now determined using the Entry Age Normal cost method, represents the ultimate cost of the benefits and the accrued liability contribution is an addition (reduction in case of a surplus) due to the amortization of the unfunded accrued liability. The valuation indicates that annual employer normal cost contributions at the rate of 9.83% of active members' compensation are required to provide the currently accruing benefits of the System.

5. The following table provides the components of the total UAAL and the derivation of the amortization amounts required in accordance with the MOU.

Total UAAL Amortization Schedule
($ thousands)

	UAAL	Remaining Amortization Period (years)	Amortization Payment
Statutory Base (1984 UAAL)	4,138,969	15	353,894
2016 Base	17,554,781	30	928,943
Total UAAL	21,693,750		1,282,837
Single Equivalent Amortization Period (yrs)			25.1
Annual Valuation Payroll			3,720,751
UAAL Amortization Rate			34.48%

6. We have determined that a contribution of 34.48% of payroll is required to amortize the unfunded accrued liability of $21,693,750,225 over the scheduled amortization periods in accordance with the MOU.

7. Schedule J of this report shows the amortization schedule for the total UAAL.

SECTION V – CONTRIBUTIONS PAYABLE BY EMPLOYER

The following table shows the amount and rate of contribution payable by the employer as determined from the present valuation for the 2017/2018 fiscal year.

Contribution for	Contribution Amount	Contribution Rate
A. Normal Cost:		
Service retirement benefits	$424,679,586	11.41%
Disability benefits	22,440,498	0.60%
Survivor benefits	2,225,412	0.07%
Total Normal Cost	$449,345,496	12.08%
B. Less Member Contributions	(83,775,228)	(2.25)%
C. Employer Normal Cost	$365,570,268	9.83%
D. Unfunded Actuarial Accrued Liabilities (25.1 year level percent of payroll amortization)	$1,282,836,995	34.48%
E. Total (C. + D.)	$1,648,407,263	44.31%

The following table shows a breakdown by group of the normal cost amount and rate payable by the employer as determined from the present valuation for the 2017/2018 fiscal year.

Group	Normal Cost	Normal Rate
Tier I – Hazardous	$ 877,540	22.69%
Tier I – Plan B	11,811,772	8.42
Tier I – Plan C	256,394	6.30
Tier II – Hazardous	31,873,412	20.80
Tier II – Others	82,512,307	8.29
Tier IIA – Hazardous	89,969,539	18.37
Tier IIA – Others	86,361,068	7.56
Tier III – Hazardous	20,192,645	12.90
Tier III – Hybrid Plan	12,990,459	6.94
Tier III – Others	28,725,132	6.40
Total	$ 365,570,268	9.83%

The following table provides the projected required contributions for the fiscal year ending June 30, 2019. These results assume a 6.90% investment return on actuarial value of assets and a 24.1 year amortization period.

Projected Contributions Required for Fiscal Year Ending June 30, 2019	Roll Forward of June 30, 2016 Valuation	
	As % of Pay	$
Employer Normal Cost	9.77%	$ 376,197,543
Unfunded Actuarial Accrued Liabilities	37.49%	1,443,698,175
Total	47.26%	$1,819,895,718

SECTION VI – ACCOUNTING INFORMATION

1. Governmental Accounting Standards Board (GASB) issued Statements No. 67 and 68 which replaced Statements No. 25 and 27 for plan years beginning after June 15, 2013. The information required under the new GASB Statements will be issued in separate reports. The following is a distribution of the number of employees by type of membership:

NUMBER OF ACTIVE AND RETIRED MEMBERS
AS OF JUNE 30, 2016

GROUP	NUMBER
Retirees and beneficiaries currently receiving benefits	48,191
Terminated employees entitled to benefits but not yet receiving benefits	1,412
Active plan members	50,019
Total	99,622

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

SCHEDULE OF FUNDING PROGRESS
(Dollar amounts in thousands)

Actuarial Valuation Date	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) - PUC (b)	Unfunded AAL (UAAL) (b – a)	Funded Ratio (a / b)	Covered Payroll (c)	UAAL as a Percentage of Covered Payroll ((b – a) / c)
6/30/2008	$9,990,247	$19,243,373	$9,253,126	51.9%	$3,497,445	264.6%
6/30/2010	9,349,605	21,054,197	11,704,592	44.4	3,295,666	355.2
6/30/2011	10,122,765	21,126,725	11,003,960	47.9	3,210,666	342.7
6/30/2012	9,744,986	23,018,752	13,273,766	42.3	3,354,682	395.7
6/30/2014	10,584,795	25,505,610	14,920,815	41.5	3,487,577	427.8
6/30/2016	11,922,966	33,616,716	21,693,750	35.5	3,720,751	583.0

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

3. The following shows the schedule of employer contributions (all dollar amounts are in thousands).

Fiscal Year Ending June 30	Valuation Date Ending June 30	Annual Required Contribution	Actual Contribution	Percentage Contributed
2014	2012	$ 1,268,935	$ 1,268,890	100.0%
2015	2012	1,379,189	1,371,651	99.5%
2016	2014	1,514,467	1,501,805	99.2%
2017	2014	1,569,142	N/A	N/A
2018	2016	1,648,407	N/A	N/A
2019	2016	1,819,896	N/A	N/A

4. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2016. Additional information as of the latest actuarial valuation follows.

Valuation date	6/30/2016
Actuarial cost method	Entry Age Normal
Amortization method	Level percent of payroll, closed phasing in to Level dollar
Remaining amortization period	25.1 years
Asset valuation method	5-year smoothed actuarial value
Actuarial assumptions:	
Investment rate of return*	6.90%
Projected salary increases*	3.50% - 19.50%
Cost-of-living adjustments	2.25% - 3.25%
Social Security Wage Base	3.50%
*Includes inflation at	2.50%

SECTION VII – EXPERIENCE

Actual experience will never (except by coincidence) coincide exactly with assumed experience. It is assumed that gains and losses will be in balance over a period of years, but sizable year to year fluctuations are common. Detail on the derivation of the experience gain/(loss) for the two year period ended June 30, 2016 is shown below. Schedule H provides detailed gain/(loss) by source.

		$ Millions
(1)	UAAL* as of June 30, 2014	$ 14,920.8
(2)	Total Normal cost from 2014 valuation	355.9
(3)	Actual Employer and Employee contributions	1,565.1
(4)	Interest accrual: [[(1) +(2)] x .08] - [(3) x .0392]	1,160.7
(5)	Expected UAAL as of June 30, 2015: (1) + (2) – (3) + (4)	$ 14,872.3
(6)	Total Normal cost for 2015 fiscal year	371.7
(7)	Actual Employer and Employee contributions	1,652.8
(8)	Interest accrual: [[(5) + (6)] x .08] - [(7) x .0392]	1,154.7
(9)	Expected UAAL as of June 30, 2016: (5) + (6) - (7) + (8)	$ 14,745.9
(10)	Assumption Changes	5,918.7
(11)	Expected UAAL as of June 30, 2016: (9) + (10)	$ 20,664.6
(12)	Actual UAAL as of June 30, 2016	$ 21,693.8
(13)	Gain/(loss): (11) – (12) (See Schedule H)	$ (1,029.2)
(14)	Gain/(loss) as percent of actuarial accrued liabilities at June 30, 2014 ($25,505.6)	(4.0)%

*Unfunded actuarial accrued liability.

Valuation Date June 30	Actuarial Gain/(Loss) as a % of Beginning Accrued Liabilities
2012	(4.2)%
2014	(5.8)%
2016	(4.0)%

SCHEDULE A

RESULTS OF VALUATION

PREPARED AS OF JUNE 30, 2016

	JUNE 30, 2016	JUNE 30, 2014
1. ACTUARIAL ACCRUED LIABILITY		
Present value of prospective benefits payable in respect of:		
(a) Present active members		
- Tier I – Hazardous Duty	$ 35,476,559	$ 49,210,224
- Tier I – Plan B	1,100,666,744	1,173,883,113
- Tier I – Plan C	29,989,124	37,753,401
- Tier II – Hazardous Duty	1,167,894,629	1,188,010,935
- Tier II – All Others	3,970,398,943	2,715,215,560
- Tier IIA – Hazardous Duty	1,911,223,376	912,871,620
- Tier IIA – All Others	1,879,763,792	1,057,034,112
- Tier III – Hazardous Duty	74,198,135	9,671,840
- Tier III – Hybrid Plan	392,510,313	204,950,079
- Tier III – All Others	122,993,068	27,212,681
- Total actives	$ 10,685,114,683	$ 7,375,813,565
(b) Present inactive members and members entitled to deferred vested benefits:	266,708,800	225,853,075
(c) Present annuitants and beneficiaries	22,664,892,602	17,903,943,137
(d) Total actuarial accrued liability [1(a) + 1(b) + 1(c)]	$ 33,616,716,085	$ 25,505,609,777
2. ACTUARIAL VALUE OF ASSETS	$ 11,922,965,860	$ 10,584,795,257
3. UNFUNDED ACTUARIAL ACCRUED LIABILITY [1(d) – 2]	$ 21,693,750,225	$ 14,920,814,520

Note: the June 30, 2016 valuation results reflect all changes to assumptions and methods including the decrease in the investment rate of return assumption from 8.00% to 6.90%.

SCHEDULE B

DEVELOPMENT OF ACTUARIAL VALUE OF ASSETS

	June 30, 2016	June 30, 2015	June 30, 2014
(1) Actuarial Value Beginning of Year*	$11,389,603,128	$10,584,795,257	$9,784,500,362
(2) Market Value End of Year**	10,636,702,645	10,737,492,074	10,472,567,077
(3) Market Value Beginning of Year	10,737,492,074	10,472,567,077	9,182,442,986
(4) Cash Flow			
(a) Contributions**	1,652,823,497	1,565,148,396	1,419,894,684
(b) Disbursements	(1,736,278,654)	(1,657,588,460)	(1,570,558,006)
(c) Net: (4)(a) + (4)(b)	(83,455,157)	(92,440,064)	(150,663,322)
(5) Investment Income			
(a) Market Total: (2) – (3) – (4)(c)	(17,334,272)	357,365,061	1,440,787,413
(b) Assumed Rate	8.00%	8.00%	8.00%
(c) Amount for Immediate Recognition: [(1) x (5)(b)] + [(4)(c) less Receivable**] x (5)(b) x 0.5	907,190,445	842,839,661	776,485,566
(d) Amount for Phased-In Recognition: (5)(a) – (5)(c)	(924,524,717)	(485,474,600)	664,301,847
(6) Phased-In Recognition of Investment Income			
(a) Current Year: (5)(d) x 0.20	(184,904,943)	(97,094,920)	132,860,369
(b) First Prior Year	(97,094,920)	132,860,369	40,945,727
(c) Second Prior Year	132,860,369	40,945,727	(182,178,789)
(d) Third Prior Year	40,945,727	(182,178,789)	159,875,887
(e) Fourth Prior Year	(182,178,789)	159,875,887	22,969,457
(f) Total Recognized Investment Gain	(290,372,556)	54,408,274	174,472,651
(7) Preliminary Actuarial Value End of Year: (1) + (4)(c) + (5)(c) + (6)(f)	11,922,965,860	11,389,603,128	10,584,795,257
(8) Final Actuarial Value End of Year Using 20% Corridor: Greater of [(7) and .8 x (2)], but no more than 1.2 x (2)	11,922,965,860	11,389,603,128	10,584,795,257
(9) Difference Between Market & Actuarial Values: (2) – (8)	$(1,286,263,215)	$(652,111,054)	$(112,228,180)
(10) Rate of Return on Preliminary Actuarial Value	5.30%	8.46%	9.73%

* Before corridor constraints, if applicable.

** Includes receivables of: $15,989,968 at 6/30/2016, $6,158,929 at 6/30/2015 and $6,198,255 at 6/30/2014.

SCHEDULE C

SUMMARY OF RECEIPTS AND DISBURSEMENTS
(Market Value)

	YEAR ENDING		
	June 30, 2016	**June 30, 2015**	**June 30, 2014**
Receipts for the Year			
Contributions:			
Members	$ 135,028,539	$ 187,338,535	$ 144,806,616
State	1,218,966,824	1,101,007,100	1,024,371,178
Federal (Net of Transfers)	282,838,166	270,643,832	244,518,635
Subtotal	$ 1,636,833,529	$ 1,558,989,467	$ 1,413,696,429
Amount Receivable	15,989,968	6,158,929	6,198,255
Investment Earnings (net of expenses)	(17,334,272)	357,365,061	1,440,787,413
TOTAL	$ 1,635,489,225	$ 1,922,513,457	$ 2,860,682,097
Disbursements for the Year			
Benefit Payments	$ 1,729,181,426	$ 1,650,464,672	$ 1,563,029,412
Refunds to Members	7,097,228	7,123,788	7,528,594
TOTAL	$ 1,736,278,654	$ 1,657,588,460	$ 1,570,558,006
Excess of Receipts over Disbursements	$ (100,789,429)	$ 264,924,997	$ 1,290,124,091
Reconciliation of Asset Balances			
Asset Balance as of the Beginning of Year	$ 10,737,492,074	$ 10,472,567,077	$ 9,182,442,986
Excess of Receipts over Disbursements	(100,789,429)	264,924,997	1,290,124,091
Asset Balance as of the End of Year	$ 10,636,702,645	$ 10,737,492,074	$ 10,472,567,077
Rate of Return	(0.16)%	3.43%	15.82%

SCHEDULE D

OUTLINE OF ACTUARIAL ASSUMPTIONS AND METHODS

Adopted or reaffirmed by the Commission for the June 30, 2016 and later valuations.

VALUATION INTEREST RATE: 6.90% per annum, compounded annually, net of expenses.

SALARY INCREASES:

Years of Service	Rate*
0	9.50%
1	19.50%
2	9.50%
3	5.75%
4	5.50%
5	5.25%
6	5.00%
7	5.00%
8	5.00%
9	5.00%
10	4.50%
11	4.50%
12	4.50%
13	4.50%
14	4.50%
15+	3.50%

*includes Wage Inflation of 3.50%

COST OF LIVING ADJUSTMENTS:

Group	Rate
Pre July 1, 1980 Retirees	3.25%
July 1, 1980 – June 30, 1997 Retirees	3.00%
July 1, 1997 – October 1, 2011 Retirees	2.60%
Post October 1, 2011 Retirees	2.25%

SOCIAL SECURITY WAGE BASE INCREASES: 3.50% per annum.

PAYROLL GROWTH ASSUMPTION: 3.50% per annum.

IMPACT OF LONGLEY DECISION: Benefits for members retiring from service on or after the *Longley* decision date are assumed to increase by 0.084% as a result of the revised treatment of longevity pay. Retroactive application of *Longley* has been reflected in this valuation to the extent impacted retiree benefits have been recalculated.

SEPARATIONS BEFORE SERVICE RETIREMENT: Representative values of the assumed annual rates of separation before service retirement are as follows:

WITHDRAWAL

Annual Rates of Withdrawal								
	Years of Service							
Age	0	1	2	3	4	5	6-9	10+
Hazardous Males								
20	6.00%	3.00%	6.00%	3.00%	2.75%	2.00%	1.25%	1.25%
25	6.00	3.00	6.00	3.00	2.75	2.00	1.25	1.25
30	6.00	3.00	4.00	3.00	2.75	2.00	1.25	1.25
35	6.00	3.00	4.00	3.00	2.00	2.00	1.25	1.25
40	8.75	3.00	4.00	3.50	2.00	2.50	1.25	1.25
45	8.75	4.00	4.00	3.50	2.00	2.50	1.25	1.25
50	8.75	5.50	4.00	3.50	2.00	2.50	1.25	1.25
55+	8.75	6.00	4.00	3.50	2.00	2.50	1.25	1.25
Hazardous Females								
20	10.00%	10.00%	5.00%	2.50%	3.00%	3.50%	2.50%	1.25%
25	10.00	10.00	5.00	2.50	3.00	3.50	2.50	1.25
30	12.00	6.00	5.00	2.50	3.00	3.50	2.50	1.25
35	12.00	5.00	6.00	2.50	4.00	3.50	2.50	1.25
40	12.00	5.00	6.00	2.00	4.00	3.50	2.50	1.25
45	12.00	5.00	5.00	2.00	4.00	3.50	2.50	1.25
50	12.00	8.00	5.00	2.00	4.00	3.50	2.50	1.25
55+	12.00	8.00	5.00	2.00	4.00	3.50	2.50	1.25
Nonhazardous Males								
20	45.0%	40.0%	40.0%	20.0%	20.0%	10.0%	6.0%	5.0%
25	30.0	28.0	19.0	10.0	7.0	10.0	6.0	5.0
30	22.0	20.0	14.0	9.0	6.0	7.0	4.5	5.0
35	20.0	15.0	14.0	8.0	6.0	4.0	4.0	3.0
40	20.0	15.0	10.0	8.0	6.0	4.0	4.0	2.5
45	22.0	12.0	10.0	8.0	6.0	4.0	4.0	2.0
50	22.0	12.0	10.0	8.0	5.0	4.0	4.0	2.0
55+	25.0	19.0	10.0	8.0	4.0	4.0	3.5	2.0
Nonhazardous Females								
20	45.0%	45.0%	45.0%	20.0%	8.0%	10.0%	6.0%	4.0%
25	25.0	23.0	15.0	12.0	8.0	10.0	6.0	4.0
30	20.0	19.0	12.0	9.0	7.0	6.0	5.0	4.0
35	18.0	13.0	11.0	8.0	6.0	5.0	4.0	3.0
40	18.0	13.0	10.0	8.0	5.5	4.0	3.5	2.5
45	18.0	13.0	10.0	6.0	5.5	4.0	3.0	2.5
50	18.0	13.0	10.0	6.0	5.5	4.0	3.0	2.0
55+	18.0	13.0	10.0	6.0	5.5	4.0	3.0	2.0

DISABILITY

Annual Rates of Disability		
Age	**Hazardous**	**Non-Hazardous**
30	0.05%	0.04%
35	0.12	0.05
40	0.18	0.10
45	0.35	0.12
50	0.40	0.20
55	0.50	0.40
60	0.65	0.50
65	0.80	0.60
70	1.35	0.60

RETIREMENT: The assumed annual rates of retirement are shown below.

Annual Rates of Retirement			
Hazardous			
Age	Tier I, II & IIA		Tier III
	First Year Eligible	All Years After	
40	50%	50%	20%
41	30	40	20
42	30	35	20
43	30	30	20
44	30	25	20
45	40	25	20
46	40	25	20
47	40	25	20
48	40	15	20
49	40	15	20
50	40	20	20
51	40	20	20
52	40	20	20
53	40	25	20
54	40	25	20
55	40	25	20
56	40	25	20
57	40	15	20
58	40	25	20
59	40	20	20
60-64	50	30	20
65-69	50	50	20
70-79	100	30	20
80	100	100	100

Annual Rates of Retirement									
Nonhazardous									
Age	Tier I			Tier II & IIA			Tier III		
	Early	First Year	Other Years	Early	First Year	Other Years	Early	First Year	Other Years
55	6.0%	28.0%		4.5%					
56	6.0	10.0	15.0%	4.0					
57	6.0	10.0	12.5	4.0					
58	6.0	10.0	10.0	4.0			5.0%		
59	6.0	10.0	10.0	4.0			7.0		
60		12.5	12.5	4.0	13.5%		9.0		
61		15.0	12.5	4.0	15.0	13.0%	10.0		
62		10.0	20.0		15.0	24.0	12.0		
63		35.0	15.0		15.0	15.0	12.0	32.0%	
64		45.0	10.0		15.0	15.0	12.0	30.0	30.0%
65		65.0	15.0		25.0	15.0		28.0	25.0
66		65.0	20.0		25.0	21.0		25.0	35.0
67		65.0	22.0		25.0	24.0		25.0	35.0
68		65.0	15.0		25.0	18.0		25.0	35.0
69		65.0	15.0		25.0	18.0		25.0	30.0
70		100.0	15.0		50.0	20.0		50.0	30.0
71		100.0	15.0		50.0	24.0		50.0	30.0
72		100.0	15.0		50.0	22.0		50.0	30.0
73		100.0	15.0		50.0	22.0		50.0	30.0
74		100.0	15.0		50.0	22.0		50.0	30.0
75		100.0	15.0		100.0	22.0		100.0	30.0
76		100.0	15.0		100.0	25.0		100.0	30.0
77		100.0	15.0		100.0	22.0		100.0	30.0
78		100.0	15.0		100.0	25.0		100.0	30.0
79		100.0	15.0		100.0	22.0		100.0	30.0
80		100.0	100.0		100.0	100.0		100.0	100.0

DEATHS AFTER RETIREMENT: The RP-2014 White Collar Mortality Table projected to 2020 by Scale BB at 100% for males and 95% for females is used for the period after retirement and for dependent beneficiaries. Representative values of the assumed annual rates of mortality are as follows:

Age	Males	Females	Age	Males	Females
40	0.043%	0.031%	65	0.705%	0.579%
45	0.067	0.052	70	1.133	0.933
50	0.272	0.194	75	1.943	1.553
55	0.384	0.250	80	3.407	2.688
60	0.501	0.348	85	6.247	4.826

In our opinion, the projection of the mortality rates with Scale BB provide a sufficient margin in the assumed rates of mortality to allow for additional improvement in mortality experience.

The RP-2014 Disabled Retiree Mortality Table at 65% for males and 85% for females is used for the period after disability.

ASSET METHOD: Actuarial Value, as developed in Schedule B. The actuarial value of assets recognizes a portion of the difference between the market value of assets and the expected value of assets, based on the assumed valuation rate of return. The amount recognized each year is 1/5 of the difference between market value and expected actuarial value. In addition, the actuarial value of assets cannot be less than 80% or more than 120% of the market value of assets.

VALUATION METHOD: Entry Age Normal cost method. See Schedule E for a brief description of this method.

SPOUSES: For members who have elected spouse coverage, husbands are assumed to be three years older than their wives.

PERCENT MARRIED: 80% of active members are assumed to be married with an average of two children who are on average age 12.

OTHER ASSUMPTIONS:

- 20% of Pre-Retirement deaths are assumed to be service related,
- 50% of Tier I Hazardous Employees are assumed to be State Police,
- To take into account State Police Supplemental Benefits and the offset of Workers Compensation, Social Security, and Non-Rehabilitation Earnings, the following minimum and maximum benefits as a percent of salary are assumed for disability benefits:

	Minimum	Maximum
Tier I State Police	60%	80%
All Other Members	40%	60%

SCHEDULE E

ACTUARIAL COST METHOD

The valuation is prepared on projected benefit basis, under which the present value of each member's expected benefits at retirement or death is determined, based on age, service and sex and using the interest rate assumed to be earned in the future (6.90% per annum). The calculations take into account the probability of a member's death or termination of employment prior to becoming eligible for a benefit, as well as the possibility of his terminating with a service, disability or survivor's benefit. Future salary increases are also anticipated. The present value of the expected benefits payable on account of the active members is added to the present value of the expected future payments to retired members, beneficiaries and members entitled to deferred vested benefits to obtain the present value of all expected benefits payable from the System on account of the present group of members and beneficiaries.

The employer contributions required to support the benefits of SERS are determined following a level funding approach, and consist of a normal cost contribution and an unfunded actuarial accrued liability contribution. The normal contribution is determined using the "entry age normal" method. Under this method, a calculation is made for pension benefits to determine the uniform and constant percentage rate of employer contribution which, if applied to the compensation of the average new member during the entire period of his anticipated covered service, would be required in addition to the contributions of the member to meet the cost of all benefits payable on his behalf.

The unfunded actuarial accrued liability is determined by subtracting the actuarial value of assets from the actuarial accrued liability. The UAAL is amortized according to the MOU between the State and SEBAC. The employer required contribution amount is the sum of the normal cost contribution and the UAAL amortization payment.

SCHEDULE F

SUMMARY OF MAIN SYSTEM PROVISIONS
AS INTERPRETED FOR VALUATION PURPOSES

The Connecticut State Employees Retirement System (CT SERS) is a defined benefit pension plan established by the Connecticut General Assembly for the purpose of providing retirement allowances and other benefits for State employees in Connecticut, and their survivors and other beneficiaries.

Eligibility Requirements

Tier I	All State Employees, Elected Officials and their Appointees hired prior to July 1, 1984. Those employees hired between July 1, 1982 and January 1, 1984 could elect to move to Tier II.
Tier II	All State Employees, Elected Officials and their Appointees hired on or after July 1, 1984.
Tier IIA	All State Employees, Elected Officials and their Appointees hired on or after July 1, 1997.
Tier III	All State Employees, Elected Officials and their Appointees hired on or after July 1, 2011.

Final Average Earnings (FAE)

Tier I, II, and IIA	Average Salary of the three highest paid years of service. Effective January 1, 1986, no one year's earnings can be greater than 130% of the average of the two preceding years in calculating the Final Average Earnings.
Tier III	Average Salary of the five highest paid years of service. No one year's earnings can be greater than 130% of the average of the two preceding years in calculating the Final Average Earnings.

Normal Retirement Benefit

Eligibility

Tier I Hazardous – 20 years of credited service.

Tier I Plans B and C – Earliest of age 55 with 25 years of service, age 60 with 10 years of service, or age 70 with 5 years of service.

Tier II Hazardous – 20 years of credited service.

Tier II and IIA – For those who will be eligible for retirement on or before July 1, 2022, the earliest of age 62 with 10 years of vesting service (effective July 1, 1992), age 60 with 25 years of vesting service, age 70 with 5 years of vesting service, or age 62 with 5 years of actual state service for terminations on or after July 1, 1997.

For those who will not be eligible for retirement on or before July 1, 2022, the earliest of age 65 with 10 years of vesting service, age 63 with 25 years of vesting service, age 70 with 5 years of vesting service.

Tier III Hazardous – Earlier of Age 50 and 20 years of benefit service or 25 years of benefit service.

Tier III – Age 63 and 25 years of benefit service or Age 65 and 10 years of benefit service.

Benefit

Tier I Hazardous – 50% of FAE plus 2% for each year of service in excess of 20.

Tier I Plan B – 2% of FAE times years of service up to age 65. Thereafter, 1% of FAE up to $4,800, plus 2% of FAE in excess of $4,800 times years of service. At age 70, greater of 1.25% of FAE up to $4,800 plus 2.5% of FAE in excess of $4,800 times years of service (maximum 20 years) or 1.0% of FAE up to $4,800 plus 2% of FAE in excess of $4,800 times year of service. Minimum benefit with 25 years is $833.34 per month.

Tier I Plan C – 2% of FAE times years of service. At age 70, greater of 2.5% of FAE times years of service (maximum 20 years) or 2.0% of FAE times years of service. Minimum benefit with 25 years is $833.34 per month.

Tier II,IIA and III Hazardous – 2.5% of FAE times years of service up to 20 years plus 2.0% of FAE times years of service in excess of 20 years, if any. Minimum benefit with 25 years is $360 per month.

Tier II, IIA and III All Others – 1.40% of FAE plus 0.433% of FAE in excess of year's breakpoint*, times years of service from October 1, 1982 up to 35 years plus 1.625% of FAE times years of service in excess of 35 years, if any. Minimum benefit with 25 years if $360 per month.

* $10,700 increased by 6% each year after 1982, rounded to nearest $100 but not greater than Social Security Covered Compensation.

Early Retirement Benefit

Eligibility	*Hazardous* – None.
	Tier I – Age 55 with 10 years of service.
	Tier II and IIA – Age 55 with 10 years of service.
	Tier III – Age 58 with 10 years of service.
Benefit	*Tier I* – Benefit is Normal Retirement Benefit reduced for retirement prior to age 60 with less than 25 years of service.
	Tier II, IIA and III – Benefit is Normal Retirement Benefit reduced 0.25% (effective July 1, 1991) for each month prior to age 60 if at least 25 years of service or age 62 if at least 10 but less than 25 years of service.
	For those who retire on or after October 2, 2011 but prior to meeting the age and service requirements for a normal retirement, will be subject to a benefit reduced by 0.50% for each month prior to Normal Retirement.

Disability Retirement Benefit

Tier I	For non-service disabilities occurring prior to age 60 with at least 5 years of service, benefit is 3% of FAE times years of service; maximum benefit is 1.667% of FAE times year of service projected to age 65.
	For service disabilities occurring prior to age 60, benefit is 1.667% of Salary times years of service projected to age 65 (maximum 30 years).
	Exception: State Police benefit is equal to the normal retirement benefit if more than 20 years of service. State Police also receives an additional benefit of $360 per month plus $300 to spouse plus $300 to a surviving dependent child.
Tier II, IIA and III	Prior to age 65 for service related disability or at any age with at least 10 years of service, benefit is 1.333% of FAE plus 0.50% of FAE in excess of the year's breakpoint, times service projected to age 65 (maximum 30 years).

Deferred Vested Retirement Benefit

Eligibility	*Tier I* - 10 years of service. *Tier II and IIA* – Effective July 1, 1997, 5 years of actual state service, 10 years of vesting service, or age 70 with 5 years of service. *Tier III* – 10 years of benefit service.
Benefit	*Tier I* – Benefit is payable at Normal Retirement Age or an Early Retirement Benefit is payable at age 55. *Tier II and IIA* – Benefit is payable at Normal Retirement Age or an Early Retirement Benefit is payable at age 55. *Tier III* – Benefit is payable at Normal Retirement Age or an Early Retirement Benefit is payable at age 58.

Pre-Retirement Spouse's Benefit

Tier I	State Police – Survivor benefits to spouse of $670 per month plus $300 to a surviving dependent child. If eligible for early or normal retirement, 50% of the average of the Life Benefit and the 50% Joint & Survivor Benefit the member would have received. If not eligible for retirement but with 25 years of service, the same benefit calculated as though age 55 using service and earnings at death. If not eligible for retirement, return of contributions (5% interest).
Tier II, IIA and III	If eligible for early or normal retirement, 50% of the 50% Joint & Survivor Benefit the member would have received. If not eligible for retirement but with 25 years of service, the same benefit calculated as though age 55 using service and earnings at death. If not eligible for retirement, return of contributions (5% interest).
Tiers I, II, IIA and III	If death is due to employment and there are dependent children under age 18, spouse will be paid $100,000 in 10 annual installments while living and not remarried. In addition, $50 per month will be paid to each child while under age 18. If death is due to employment and there are no dependent children under age 18, spouse will be paid $50,000 in not less than 10 annual installments.

Payment Options	50% or 100% Joint and Survivor (Normal Form if married). Straight life annuity (Normal Form if not married). 10 or 20 year certain and life annuity.
Cost of Living Adjustments (COLA)	Annual adjustments each July 1 of up to 5% for retirements prior to July 1, 1980; 3% for retirements after July 1, 1980. For members (and beneficiaries) not covered by Social Security and age 62 and over, the maximum increase is 6%. For employees retiring after June 30, 1999, the annual adjustment will be 60% of the increase in CPI up to 6% and 75% of the increase in the CPI over 6%. This adjustment will be no less than 2.5% and no greater than 6%. Employees retiring between July 1, 1997 and June 30, 1999 made an irrevocable choice between the above formula and a fixed 3% annual adjustment. An employee from Tier IIA must have at least 10 years of actual state service or directly make the transition into retirement in order to be eligible for annual adjustments. For employees retiring on or after October 2, 2011, the minimum COLA shall be 2.0% and the maximum COLA shall be 7.5%.

Member Contributions*

Tier I – Hazardous	4% of earnings up to Social Security Taxable Wage Base plus 5% of earnings above that level.
Tier I – Plan B	2% of earnings up to Social Security Taxable Wage Base plus 5% of earnings above that level.
Tier I – Plan C	5% of earnings.
Tier II – Hazardous	4% of earnings.
Tier II – All Others	None.
Tier IIA & III – Hazardous	5% of earnings.
Tier IIA & III – All Others	2% of earnings.

* Increased for anyone electing to maintain retirement eligibility.

Hybrid Defined Benefit/Defined Contribution Plan for Employees of Higher Learning

Individuals hired on or after July 1, 2011 otherwise eligible for the Alternate Retirement Plan ("ARP") shall be eligible to be members of the new Hybrid Plan in addition to their existing choices. Individuals who are currently members of the ARP shall be eligible to join the Hybrid Plan on a one time option at the full actuarial cost. The Hybrid Plan shall have defined benefits identical to Tier II/IIA and Tier III for individuals hired on or after July 1, 2011, but shall require employee contributions 3% higher than the contribution required from the Applicable Tier II/IIA/III Plan. An employee shall have the option, upon leaving state service, of accepting the defined benefit amount, or electing to receive a return of his/her contributions to the Hybrid Plan, plus a 5% employer match, plus 4% interest ("cash out option"). In the event the employee elects the cash out option, he/she shall permanently waive any entitlement they may have to health insurance as a retired state employee unless they convert the cash out option to a periodic payment as would be required under the current ARP Plan.

SCHEDULE G

TABLES OF MEMBERSHIP DATA

STATUS RECONCILIATION OF ACTIVE MEMBERS

	Total
As of June 30, 2014	49,976
Retirements	(3,665)
Disability	(291)
Terminated Vested	(95)
Terminated Non-Vested	(33)
Deaths	(74)
Rehires	645
New Participants	6,864
Refunds	(3,308)
As of June 30, 2016	50,019

STATUS RECONCILIATION OF INACTIVE MEMBERS

	Retirees	Disability	Survivor	Deferred Vested	Total
As of June 30, 2014	37,158	4,092	4,553	1,457	47,260
Retirements	185	(9)		(176)	0
Disability	(3)	3			0
Survivors	(403)	(41)	444		0
Deaths with no Survivors	(75)	(7)	(11)	(1)	(94)
Rehires	(3)	(2)		(15)	(20)
Refunds					0
Certain Period Ended			(7)		(7)
Data Corrections	(1,337)	(95)	(258)	52	(1,638)
From Active	3,665	291	51	95	4,102
As of June 30, 2016	39,187	4,232	4,772	1,412	49,603

SCHEDULE G
(Continued)

TIER I – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39									0
40 to 44									0
45 to 49									0
50 to 54			1				3	4	372,790
55 to 59		1	3	1		1	11	17	1,759,003
60 to 64							13	13	1,617,275
65 to 69							1	1	118,247
70 & Up									
Total		1	4	1		1	28	35	$ 3,867,315

Average Age: 58.7
Average Service: 31.9

Average Salary: $110,495

SCHEDULE G
(Continued)

TIER I – PLAN B

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39									0
40 to 44									0
45 to 49									0
50 to 54	1	3	3	6	8	5	202	228	19,198,519
55 to 59	2	6	6	15	11	18	537	595	54,922,664
60 to 64	1	5	4	9	13	13	353	398	41,276,362
65 to 69		1	1	2	3	5	122	134	15,305,215
70 & Up	1	1	1				70	73	9,589,761
Total	5	16	15	32	35	41	1,284	1,428	$ 140,292,521

Average Age: 59.5
Average Service: 34.6

Average Salary: $98,244

SCHEDULE G
(Continued)

TIER I – PLAN C

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

Age	Years of Service							Total	
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39									0
40 to 44									0
45 to 49									0
50 to 54							8	8	741,694
55 to 59					1		13	14	1,162,566
60 to 64			1			1	9	11	1,053,124
65 to 69	1						6	7	551,963
70 & Up				1			4	5	557,838
Total	1		1	1	1	1	40	45	$ 4,067,185

Average Age: 61.1
Average Service: 34.4

Average Salary: $90,382

SCHEDULE G
(Continued)

TIER II – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39			2	6				8	667,248
40 to 44	1	1	4	90	63	2		161	15,829,465
45 to 49	5	3	9	127	337	64	4	549	55,951,249
50 to 54	2	3	8	68	188	142	19	430	45,071,640
55 to 59	2		7	32	89	46	29	205	20,090,596
60 to 64	1			22	48	22	14	107	10,373,088
65 to 69				12	14	9	5	40	4,207,198
70 & Up				3	5	4		12	1,072,057
Total	11	7	30	360	744	289	71	1,512	$ 153,262,541

Average Age: 51.0
Average Service: 22.5

Average Salary: $101,364

SCHEDULE G
(Continued)

TIER II – ALL OTHERS

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25									$ 0
25 to 29									0
30 to 34									0
35 to 39	1	1	8	14	1			25	1,734,561
40 to 44	7	8	18	115	149	3		300	24,569,272
45 to 49	41	35	60	253	946	540	39	1,914	165,537,180
50 to 54	44	56	80	253	872	1,547	634	3,486	312,135,229
55 to 59	29	44	76	177	727	1,218	751	3,022	272,530,964
60 to 64	22	27	51	138	465	652	348	1,703	154,062,902
65 to 69	11	13	22	40	170	199	106	561	49,933,159
70 & Up	6	5	7	23	62	65	25	193	14,848,597
Total	161	189	322	1,013	3,392	4,224	1,903	11,204	$ 995,351,864

Average Age: 54.9
Average Service: 24.9

Average Salary: $88,839

SCHEDULE G
(Continued)

TIER IIA – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	1							1	$ 56,317
25 to 29	10	56	2					68	4,406,410
30 to 34	21	629	127	1				778	56,600,756
35 to 39	24	493	515	166	1			1,199	94,377,198
40 to 44	7	315	407	549	51	1		1,330	115,091,374
45 to 49	8	242	314	519	40	2		1,125	96,835,384
50 to 54	7	155	220	281	16	1		680	56,966,848
55 to 59	1	99	142	191	7	8		448	38,162,788
60 to 64	1	34	58	106	1	3	1	204	17,054,442
65 to 69		5	30	45	5			85	7,289,222
70 & Up		2	5	30	2			39	2,859,943
Total	80	2,030	1,820	1,888	123	15	1	5,957	$ 489,700,682

Average Age: 44.0
Average Service: 12.5

Average Salary: $82,206

SCHEDULE G
(Continued)

TIER IIA – ALL OTHERS

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	18	2						20	$ 268,190
25 to 29	81	155	7					243	12,540,189
30 to 34	128	915	217	6				1,266	79,369,221
35 to 39	124	966	775	196	1			2,062	142,186,300
40 to 44	92	842	796	776	5			2,511	185,360,057
45 to 49	89	859	835	836	7	4		2,630	194,160,857
50 to 54	101	792	815	788	7	4		2,507	183,080,846
55 to 59	100	740	726	724	10	3		2,303	168,620,263
60 to 64	70	501	547	463	14		1	1,596	117,158,089
65 to 69	48	189	242	187	5			671	46,159,364
70 & Up	56	74	65	56	3			254	12,868,435
Total	907	6,035	5,025	4,032	52	11	1	16,063	$ 1,141,771,811

Average Age: 48.4
Average Service: 11.3

Average Salary: $71,081

SCHEDULE G
(Continued)

TIER III – HAZARDOUS DUTY

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	90							90	$ 4,498,608
25 to 29	783	17						800	47,096,659
30 to 34	657	17	2		1			677	41,949,985
35 to 39	402	13	4					419	25,953,792
40 to 44	195	6						201	12,606,332
45 to 49	158	5	4	1				168	10,727,961
50 to 54	112				1		1	114	7,856,772
55 to 59	48							48	3,138,128
60 to 64	26	1			1			28	1,922,009
65 to 69	3							3	517,254
70 & Up	3							3	259,387
Total	2,477	59	10	1	3		1	2,551	$ 156,526,887

Average Age: 34.4
Average Service: 2.5

Average Salary: $61,359

SCHEDULE G
(Continued)

TIER III – HYBRID PLAN

The Number and Average Annual Compensation of Active Employees By Age and Service as of June 30, 2016

Age	Years of Service							Total	
	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	17							17	$ 614,671
25 to 29	86							86	4,504,099
30 to 34	124	9	2					135	7,281,495
35 to 39	122	23	16	3				164	10,550,526
40 to 44	98	34	39	29	4			204	15,647,042
45 to 49	102	31	73	62	19	12	1	300	27,003,456
50 to 54	57	26	67	75	37	26	12	300	27,907,979
55 to 59	56	38	81	88	62	44	25	394	38,911,004
60 to 64	28	13	56	76	59	53	24	309	33,251,200
65 to 69	11	8	31	18	18	30	27	143	17,776,128
70 & Up	4	1	5	6	5	6	8	35	3,791,227
Total	705	183	370	357	204	171	97	2,087	$ 187,238,827

Average Age: 50.4
Average Service: 12.7

Average Salary: $89,717

SCHEDULE G
(Continued)

TIER III – ALL OTHERS

The Number and Average Annual Compensation of Active Employees
By Age and Service as of June 30, 2016

	Years of Service							Total	
Age	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 30	30 & Up	No.	Payroll
Under 25	921	6						927	$ 15,277,954
25 to 29	1,552	4						1,556	70,131,138
30 to 34	1,578	10	1					1,589	83,271,627
35 to 39	1,184	8	5					1,197	68,909,620
40 to 44	930	7	3	2				942	54,857,538
45 to 49	938	10	7			2	2	959	53,609,357
50 to 54	826	5	6	2		1	1	841	45,905,126
55 to 59	565	5	3				1	574	31,616,481
60 to 64	340	7		1		1	1	350	16,684,887
65 to 69	141		1					142	6,339,608
70 & Up	57	2					1	60	2,068,460
Total	9,032	64	26	5		4	6	9,137	$ 448,671,796

Average Age: 38.7
Average Service: 2.3

Average Salary: $49,105

SCHEDULE G
(Continued)

NUMBER OF RETIRED MEMBERS AND THEIR BENEFITS BY AGE

Age	Number	Total Annual Benefits	Average Annual Benefits
Under 50	1,239	$ 55,593,013	$ 44,869
50 – 54	1,862	88,515,722	47,538
55 – 59	3,812	154,180,789	40,446
60 – 64	6,856	284,115,686	41,440
65 – 69	8,886	344,567,896	38,776
70 – 74	7,585	282,108,260	37,193
75 – 79	5,089	179,244,473	35,222
80 – 84	3,761	125,471,368	33,361
85 – 89	2,645	82,549,702	31,210
90 – 94	1,268	33,216,343	26,196
95 & Over	416	10,332,057	24,837
Total	43,419	$ 1,639,895,309	$ 37,769

NUMBER OF BENEFICIARIES AND THEIR BENEFITS BY AGE

Age	Number	Total Annual Benefits	Average Annual Benefits
Under 50	301	$ 6,256,978	$ 20,787
50 – 54	114	2,560,844	22,464
55 – 59	206	5,336,544	25,906
60 – 64	327	8,761,878	26,795
65 – 69	480	12,464,556	25,968
70 – 74	610	14,633,490	23,989
75 – 79	700	15,499,467	22,142
80 – 84	748	15,620,978	20,884
85 – 89	700	13,639,725	19,485
90 – 94	446	8,831,009	19,800
95 & Over	140	2,284,325	16,317
Total	4,772	$ 105,889,794	$ 22,190

SCHEDULE G
(Continued)

NUMBER OF DEFERRED VESTED MEMBERS AND THEIR BENEFITS BY AGE

Age	Number	Total Annual Benefits	Average Annual Benefits
Under 50	493	$ 6,129,543	$ 12,4331
50 – 54	535	9,027,565	16,874
55 – 59	249	3,655,870	14,682
60 – 64	108	1,232,114	11,408
65 – 69	20	201,705	10,085
70 – 74	6	57,475	9,579
75 – 79	1	11,808	11,808
80 – 84	0	0	0
85 – 89	0	0	0
90 – 94	0	0	0
95 & Over	0	0	0
Total	1,412	$ 20,316,080	$ 14,388

SCHEDULE H

ANALYSIS OF FINANCIAL EXPERIENCE

Gains & Losses in Accrued Liabilities Resulting from Difference Between Assumed Experience & Actual Experience ($ Millions)

Type of Activity	$ Gain (or Loss) For Two Year Period Ending 6/30/2016
Age & Service Retirements. If members retire at older ages, there is a gain. If younger ages, a loss.	$ (343.3)
Disability Retirements. If disability claims are less than assumed, there is a gain. If more claims, a loss.	(55.8)
Death-in Service Benefits. If survivor claims are less than assumed, there is a gain. If more claims, there is a loss.	(24.9)
Withdrawal From Employment. If more liabilities are released by withdrawals than assumed, there is a gain. If smaller releases, a loss.	(1.8)
Pay Increases. If there are smaller pay increases than assumed, there is a gain. If greater increases, a loss.	(203.3)
New Members. Additional unfunded accrued liability will produce a loss.	(282.8)
Investment Income. If there is a greater investment income than assumed, there is a gain. If less income, a loss.	(232.5)
Death After Retirement. If retirants live longer than assumed, there is a loss. If not as long, a gain.	(65.9)
Other. Miscellaneous gains and losses resulting from changes in valuation software, data adjustments, timing of financial transactions, etc.	181.1
Gain (or Loss) During Year From Financial Experience	$ (1,029.2)
Non-Recurring Items. Adjustments for plan amendments, assumption changes, or method changes.	(5,918.7)
Composite Gain (or Loss) During Year	$ (6,947.9)

SCHEDULE I

ACTUARIAL SURPLUS TEST

Section 5-162(h) of the General Statutes of Connecticut provides that the Retirement Commission may grant additional Cost-of-Living Adjustments (COLAs) for retired members if an actuarial surplus exists. An actuarial surplus is deemed to exist if three criteria are met.

I. ***Investment Income:*** The actual rate of return for the Fiscal Year ending on the valuation date must exceed the actuarial interest rate assumption.

Market Value of Assets on June 30, 2015: (A)	$10,737,492,074
Market Value of Assets on June 30, 2016: (B)	$10,636,702,645
Investment Income for FY 2015-2016: (I)	$(17,334,272)
Actual Rate of Return for FY 2015-2016: 2I / (A + B – I)	(0.16)%
Actuarial Interest Rate Assumption:	8.00%

Actual return of (0.16)% is less than the assumed 8.00%, so the first criterion is not met.

II. ***Assets vs. Liabilities:*** Market value of assets must exceed 50% of specified liabilities.

Market Value of Assets on June 30, 2016:	$10,636,702,645
Specified Liabilities on June 30, 2016:	
Liability for Retired Members	$22,664,892,602
Liability for Terminated Vested Members	$266,708,800
Liability for Member Contributions with Interest	$1,091,811,686
Total	$24,023,413,088
50% of Specified Liabilities	$12,011,706,544

Market Value does not exceed 50% of specified liabilities so the second criterion is not met.

III. ***Unfunded Liability***: Actual unfunded liability must be less than the projected unfunded liability five years from the determination date.

Actual Unfunded Liability on June 30, 2016:	$21,693,750,225
Projected Unfunded Liability on June 30, 2021 (see next page):	$8,454,273,000

Actual Unfunded Liability is not less than Projected Unfunded Liability so the third criterion is not met and therefore, no actuarial surplus exists.

SCHEDULE I
(continued)

ACTUARIAL SURPLUS TEST
PROJECTION OF UNFUNDED LIABILITY

Section 5-162-h(b)(2) of the General Statutes of Connecticut specifies the means of calculating the Projected Unfunded Liability used in the third criterion of the Actuarial Surplus Test. The projection reflects the actual unfunded liability as of December 31, 1983 adjusted for changes in actuarial assumptions and cost methods through the determination date. No provision is made in the Statute for reflecting the impact of plan changes. The projection below reflects the following changes: data correction (June 30, 1987); change in actuarial assumptions (June 30, 1987); change in actuarial cost method (June 30, 1988); change in actuarial assumptions - interest rate only (June 30, 1989); change in actuarial cost method – amortization period only (June 30, 1992); change in actuarial assumptions (June 30, 1993); change in actuarial cost method – level percent amortization (June 30, 1997); change in actuarial methods and assumptions (June 30, 2000); change in actuarial assumptions (June 30, 2004); change in actuarial assumptions (June 30, 2008); change in actuarial assumptions (June 30, 2012) change in actuarial assumptions (June 30, 2016).

Year	($000) June 30 Unfunded Liability	Year	($000) June 30 Unfunded Liability	Year	($000) June 30 Unfunded Liability
1987	$2,524,556	2002	$2,360,589	2017	$9,951,987
1988	1,954,257	2003	2,429,273	2018	9,659,917
1989	1,432,333	2004	2,502,591	2019	9,424,079
1990	1,939,758	2005	2,569,504	2020	9,140,386
1991	1,930,524	2006	2,634,814	2021	8,804,428
1992	1,920,505	2007	2,698,021	2022	8,411,458
1993	1,794,192	2008	2,823,251	2023	7,956,355
1994	1,787,586	2009	2,861,884	2024	7,433,609
1995	1,780,419	2010	2,895,933	2025	6,837,282
1996	1,772,643	2011	2,924,709	2026	6,160,985
1997	1,764,205	2012	4,160,465	2027	5,397,841
1998	1,835,087	2013	4,172,971	2028	4,540,451
1999	1,907,249	2014	4,174,465	2029	3,580,857
2000	2,222,296	2015	4,163,616	2030	2,510,500
2001	2,291,494	2016	10,057,733	2031	1,320,178
				2032	0

SCHEDULE J

PROJECTION OF 2016 VALUATION UNFUNDED ACCRUED LIABILITY

Valuation Year	Unfunded Accrued Liability ($ in thousands)	Amortization Payment ($ in thousands)
2016	$ 21,693,750	$ 1,282,837
2017	21,862,883	1,430,783
2018	21,900,577	1,578,782
2019	21,799,780	1,723,841
2020	21,555,990	1,862,825
2021	21,167,489	1,992,571
2022	20,635,474	1,992,571
2023	20,066,750	1,992,571
2024	19,458,785	1,992,571
2025	18,808,869	1,992,571
2026	18,114,110	1,992,571
2027	17,371,412	1,992,571
2028	16,577,468	1,992,571
2029	15,728,742	1,992,571
2030	14,821,454	1,992,571
2031	13,851,562	1,511,235
2032	13,296,085	1,511,235
2033	12,702,279	1,511,235
2034	12,067,501	1,511,235
2035	11,388,923	1,511,235
2036	10,663,524	1,511,235
2037	9,888,071	1,511,235
2038	9,059,113	1,511,235
2039	8,172,956	1,511,235
2040	7,225,655	1,511,235
2041	6,212,990	1,511,235
2042	5,130,451	1,511,235
2043	3,973,216	1,511,235
2044	2,736,133	1,511,235
2045	1,413,691	1,511,235
2046	0	