Cavanaugh Macdonald
CONSULTING, LLC

The experience and dedication you deserve

GASB STATEMENT NO. 68 REPORT

FOR THE

CONNECTICUT STATE EMPLOYEES' RETIREMENT SYSTEM

PREPARED AS OF JUNE 30, 2016

www.CavMacConsulting.com

Cavanaugh Macdonald
CONSULTING, LLC
The experience and dedication you deserve

March 8, 2017

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

Members of the Commission:

Presented in this report is information to assist the Connecticut State Employees' Retirement System in meeting the requirements of the Governmental Accounting Standards Board (GASB) Statement No. 68 and to identify the information to be provided by the actuary, Cavanaugh Macdonald Consulting (CMC). The information is presented for the period ending June 30, 2016 (the Measurement Date).

GASB Statement No. 68 establishes accounting and financial reporting requirements for governmental employers who provide pension benefits to their employees through a trust.

The annual actuarial valuation used as a basis for much of the information presented in this report was performed as of June 30, 2016. The valuation was based on data, provided by the Retirement System staff, for active, inactive and retired members along with pertinent financial information.

The actuarial calculations were performed by qualified actuaries according to generally accepted actuarial procedures and methods. The calculations are based on the current provisions of the System, and on actuarial assumptions that are, individually and in the aggregate, internally consistent and reasonably based on the actual experience of the System. In addition, the calculations were completed in compliance with the laws governing the System and, in our opinion, meet the requirements of GASB 68. The undersigned are members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinions contained herein.

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

These results are only for financial reporting and may not be appropriate for funding purposes or other types of analysis. Calculations for purposes other than satisfying the requirements of GASB 67 and GASB 68 may produce significantly different results. Future actuarial results may differ significantly from the current results presented in the report due to such factors as changes in plan experience or changes in economic or demographic assumptions.

Sincerely yours,

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

TABLE OF CONTENTS

REPORT OF THE ANNUAL GASB STATEMENT NO. 68
REQUIRED INFORMATION FOR THE
CONNECTICUT STATE EMPLOYEES' RETIREMENT SYSTEM

PREPARED AS OF JUNE 30, 2016

SECTION I – INTRODUCTION

The Governmental Accounting Standards Board issued Statement No. 68 (GASB 68), *"Accounting and Financial Reporting For Pensions"* in June 2012. This report, prepared as of June 30, 2016 (the Measurement Date), presents information to assist the Connecticut State Employees Retirement System (SERS) in meeting the requirements of GASB 68 for the fiscal year ending June 30, 2017 (Reporting Date). Much of the material provided in this report is based on the data, assumptions, and results of the annual actuarial valuation of SERS as of June 30, 2016. The results of that valuation were detailed in a report dated January 19, 2017. Connecticut State Employees Retirement System is a single-employer defined benefit pension plan.

GASB 68 replaced GASB 27 and represents a significant departure from the requirements of that prior statement. GASB 68 created disclosure and reporting requirements that may or may not be consistent with the basis used for funding the Plan.

Two major changes in GASB 68 are the requirements to include Net Pension Liability (NPL) and to recognize a Pension Expense (PE) in the employer's financial reporting.

The NPL shown in the GASB Statement No. 67 Report for the Connecticut State Employees Retirement System Prepared as of June 30, 2016 and submitted February 16, 2017 is the NPL used for purposes of GASB 68. Please refer to that report for the derivation of the NPL.

Pension Expense includes amounts for service cost (the Normal Cost under the Entry Age Normal actuarial cost method for the year), interest on the Total Pension Liability (TPL), changes in benefit structure, amortization of increases/decreases in liability due to actuarial experience and actuarial assumption changes, and amortization of investment gains/losses. The actuarial experience and assumption change impacts are amortized over the average expected remaining service life of the Plan membership as of the Measurement Date, and investment gains/losses are amortized over five years. The development of the PE is shown in Section IV.

The unamortized portions of each year's experience, assumption changes and investment gains/losses are used to develop deferred inflows and outflows, which also must be included in the employer's financial reporting. The development of the collective deferred inflows and outflows is shown in Section III.

Section II of this report is a summary of the principal results of the amounts under GASB 68. Section III provides the results of all the necessary calculations, presented in the order laid out in GASB 68 for note disclosure and Required Supplementary Information (RSI).

SECTION II – SUMMARY OF PRINCIPAL RESULTS
($ IN THOUSANDS)

Valuation Date (VD):	June 30, 2016
Measurement Date (MD):	June 30, 2016
Reporting Date (RD):	June 30, 2017
Membership Data:	
Retirees and Survivors	48,191
Inactive Members	1,412
Active Members	50,019
Total	99,622
Single Equivalent Interest Rate (SEIR):	
Long-Term Expected Rate of Return	6.90%
Municipal Bond Index Rate at Measurement Date	3.01%
Fiscal Year in which Plan's Fiduciary Net Position is projected to be depleted from future benefit payments for current members	N/A
Single Equivalent Interest Rate	6.90%
Net Pension Liability:	
Total Pension Liability (TPL)	$ 33,616,716
Fiduciary Net Position (FNP)	10,653,792
Net Pension Liability (NPL = TPL – FNP)	$ 22,962,924
FNP as a percentage of TPL	31.69%
Pension Expense:	$ 2,491,118
Deferred Outflows of Resources:	$ 5,452,126
Deferred Inflows of Resources:	$ 0

SECTION III – NOTES TO FINANCIAL STATEMENTS

The material presented herein will follow the order presented in GASB 68. Paragraph numbers are provided for ease of reference.

Paragraph 40 (c): The data required regarding the membership of the Connecticut State Employees Retirement System were furnished by the Retirement System. The following table summarizes the membership of the system as of June 30, 2016, the Measurement Date.

Membership

Group	Count
Retired participants and beneficiaries currently receiving benefits	48,191
Terminated participants and beneficiaries entitled to benefits but not yet receiving benefits	1,412
Active Participants	50,019
Total	99,622

Paragraph 41: This paragraph requires information regarding the actuarial assumptions used to measure the TPL. The TPL was determined based on the annual actuarial funding valuation report prepared as of June 30, 2016. The TPL was based on the results of an actuarial experience study for the period July 1, 2011 – June 30, 2015. The complete set of actuarial assumptions utilized in developing the TPL is outlined in Schedule C. The key actuarial assumptions are summarized below:

Inflation	2.50 percent
Salary increases	3.50 – 19.50 percent, including inflation
Investment rate of return	6.90 percent, net of pension plan investment expense, including inflation

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

Paragraph 42 (a)-(f): The discount rate used to measure the TPL at June 30, 2016 was the long term rate of return, 6.90 percent. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rates and that Employer contributions will be made equal to the difference between the projected actuarially determined contribution and member contributions. Projected future benefit payments for all current plan members were projected through the year 2136.

Based on those assumptions, the System's FNP was projected to be available to make all projected future benefit payments of current plan members. Therefore, the long-term expected rate of return on pension plan investments was applied to all periods of projected benefit payments to determine the TPL and a municipal bond rate was not used in determining the discount rate.

The long-term expected rate of return on pension plan investments was determined using a log-normal distribution analysis in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The target asset allocation and best estimates of arithmetic real rates of return for each major asset class are summarized in the following table:

Asset Class	Target Allocation	Long-Term Expected Real Rate of Return
Large Cap U.S. Equities	21.0%	5.8%
Developed Non-U.S. Equities	18.0	6.6
Emerging Markets (Non-U.S.)	9.0	8.3
Real Estate	7.0	5.1
Private Equity	11.0	7.6
Alternative Investment	8.0	4.1
Fixed Income (Core)	8.0	1.3
High Yield Bonds	5.0	3.9
Emerging Market Bond	4.0	3.7
Inflation Linked Bonds	5.0	1.0
Cash	4.0	0.4

Paragraph 42 (g): This paragraph requires disclosure of the sensitivity of the NPL to changes in the discount rate. The following presents NPL of the System, calculated using the discount rate of 6.90 percent, as well as what the System's NPL would be if it were calculated using a discount rate that is 1-percentage-point lower (5.90 percent) or 1-percentage-point higher (7.90 percent) than the current rate: ($ thousands)

	1% Decrease (5.90%)	Current Discount Rate (6.90%)	1% Increase (7.90%)
Net Pension Liability	$27,250,098	$22,962,924	$19,395,014

Paragraph 44: This paragraph requires a schedule of changes in the NPL. The needed information is provided in the table below.

CHANGES IN THE NET PENSION LIABILITY
($ in Thousands)

	Total Pension Liability (TPL) (a)	Fiduciary Net Position (FNP) (b)	Net Pension Liability (NPL) (a) – (b)
Balances at June 30, 2015	27,192,467	10,668,380	16,524,087
Changes for the year:			
Service cost	322,114		322,114
Interest	2,105,947		2,105,947
Difference between expected and actual experience	772,762		772,762
Changes of assumptions	4,959,705		4,959,705
Contributions - employer		1,501,805	(1,501,805)
Contributions - employee		135,029	(135,029)
Net investment income		(100)	100
Benefit payments, including refunds of employee contributions	(1,736,279)	(1,736,279)	0
Administrative expense		(651)	651
Other changes*	0	85,608	(85,608)
Net changes	6,424,249	(14,588)	6,438,837
Balances at June 30, 2016	33,616,716	10,653,792	22,962,924

* Includes $75,550 adjustment to beginning of year net position.

Paragraph 45 (a): June 30, 2016 is the actuarial valuation date upon which the TPL is based. An expected TPL is determined as of June 30, 2016 using standard roll forward techniques. The procedure used to determine the TPL as of June 30, 2016 is shown on page 6 of the GASB 67 report for SERS submitted on February 16, 2017.

Paragraph 45 (c): Since the prior measurement date, rates of withdrawal, disability retirement, service retirement and mortality were adjusted to more closely reflect actual and anticipated experience. The analysis and basis for these changes are included in the latest Experience Investigation for the five-year period ending June 30, 2015. In addition, economic assumptions (assumed rates of inflation and investment return), the actuarial cost method, and the UAAL amortization methodology were changed in accordance with Memorandum of Agreement (MOU) between the State and SEBAC effective December 8, 2016.

Paragraph 45 (d): There was no change in the benefit terms that affected the measurement of the TPL since the prior measurement date.

Paragraph 45 (g): See Section IV for the annual Pension Expense.

Paragraph 45 (h): Since certain expense items are amortized over closed periods each year, the deferred portions of these items must be tracked annually. If the amounts serve to reduce Pension Expense they are labeled deferred inflows. If they will increase Pension Expense they are labeled deferred outflows. The amortization of these amounts is accomplished on a level dollar basis, with no interest included in the deferred amounts. Experience gains/losses and the impact of changes in actuarial assumptions, if any, are amortized over the average expected remaining service life of the active and inactive System members at the beginning of the fiscal year. Investment gains and losses are amortized over a fixed five year period.

The table below provides the calculation of the annual investment gain or loss.

Investment Earnings (Gain)/Loss as of June 30, 2016 ($000)		
a.	Expected investment rate of return	8.00%
b.	Beginning of year market value assets (BOY)	10,668,380
c.	End of year market value assets (EOY)	10,653,792
d.	Expected return on BOY for plan year (a x b)	853,470
e.	External Cash Flow	
	Contributions - employer	1,501,805
	Contributions - member	135,029
	Refunds of contributions	(7,098)
	Benefits paid	(1,729,181)
	Admin expenses	(651)
	Other changes*	85,608
	Net cash flow	(14,488)
f.	Expected return on net cash flow (a. x 0.5 x e.)	(580)
g.	Projected earnings for plan year (d. + f.)	852,890
h.	Net investment income (c. – b. – e.)	(100)
i.	**Investment earnings (gain)/loss (g. –h.)**	**852,990**
j.	Expensed portion included in Pension Expense (i. x 0.20)	170,598

* Includes $75,550 adjustment to beginning of year net position.

The table below provides a summary of the deferred inflows and outflows as of June 30, 2016 with dollar amounts in thousands.

Source	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$637,900	$0
Changes of assumptions	4,094,137	0
Net difference between projected and actual earnings on Plan investments	720,089	0
Employer contributions subsequent to the measurement date	See note	0
Total	$5,452,126	$ 0

Note: The deferred outflow of resources reported by an employer should include contributions made by the employer during its fiscal year that will be reflected in the net pension liability in the next measurement period.

Paragraph 45 (i): Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in Pension Expense as follows:

Deferred Amounts to be recognized in Fiscal Years Following the Reporting Date

Year:	Amount
1	1,135,933
2	1,135,931
3	1,278,917
4	1,171,028
5	730,317
6	0
Thereafter	0

Amounts reported as deferred outflows of resources related to pensions resulting from employer contributions subsequent to the measurement date will be recognized as a reduction of the net pension liability in the year ended June 30, 2017 (Reporting Date). Other amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense.

Deferred Outflows and Inflows for Differences between Expected and Actual Experience ($ in thousands)

				Balances as of June 30, 2017 (Reporting Date)	
Year	Experience Losses (a)	Experience Gains (b)	Amounts Recognized in Pension Expense through 2016 (c)	Deferred Outflows (a) – (c)	Deferred Inflows (b) – (c)
2016	$772,762	$0	$134,862	$637,900	$0
2015	0	0	0	0	0
2014	0	0	0	0	0
Total				$637,900	$0

Deferred Outflows and Inflows for Differences from Assumption Changes
($ in thousands)

Year	Assumption Losses (a)	Assumption Gains (b)	Amounts Recognized in Pension Expense through 2016 (c)	Balances as of June 30, 2017 (Reporting Date) Deferred Outflows (a) – (c)	Deferred Inflows (b) – (c)
2016	$4,959,705	$0	$865,568	$4,094,137	$0
2015	0	0	0	0	0
2014	0	0	0	0	0
Total				$4,094,137	$0

Deferred Outflows and Inflows for Differences in Investment Experience
($ in thousands)

Year	Investment Losses (a)	Investment Gains (b)	Amounts Recognized in Pension Expense through 2016 (c)	Balances as of June 30, 2017 (Reporting Date) Deferred Outflows (a) – (c)	Deferred Inflows (b) – (c)
2016	$852,990	$0	$170,598	$682,392	$0
2015	539,449	0	215,780	323,669	0
2014	0	714,927	428,955	0	285,972
Total				$1,006,061	$285,972
Net difference between projected and actual earnings on investments				$720,089	

Amortization of Deferrals ($ in thousands)								
	2014 Experience (Gain)/Loss		2015 Experience (Gain)/Loss		2016 Experience (Gain)/Loss		Total Deferrals	
Fiscal Year End	Amount Recognized	EOY Balance	Amount Recognized	EOY Balance	Amount Recognized	EOY Balance	Amount Recognized	EOY Balance
6/30/2015	$0	$0	$0	$0	$0	$0	$0	$0
6/30/2016	0	0	0	0	0	0	0	0
6/30/2017	0	0	0	0	134,862	637,900	134,862	637,900
6/30/2018	0	0	0	0	134,862	503,038	134,862	503,038
6/30/2019	0	0	0	0	134,862	368,176	134,862	368,176
6/30/2020	0	0	0	0	134,862	233,314	134,862	233,314
6/30/2021	0	0	0	0	134,862	98,452	134,862	98,452
6/30/2022	0	0	0	0	98,452	0	98,452	0

Amortization of Deferrals ($ in thousands)								
	2014 Assumption (Gain)/Loss		2015 Assumption (Gain)/Loss		2016 Assumption (Gain)/Loss		Total Deferrals	
Fiscal Year End	Amount Recognized	EOY Balance	Amount Recognized	EOY Balance	Amount Recognized	EOY Balance	Amount Recognized	EOY Balance
6/30/2015	$0	$0	$0	$0	$0	$0	$0	$0
6/30/2016	0	0	0	0	0	0	0	0
6/30/2017	0	0	0	0	865,568	4,094,137	865,568	4,094,137
6/30/2018	0	0	0	0	865,568	3,228,569	865,568	3,228,569
6/30/2019	0	0	0	0	865,568	2,363,001	865,568	2,363,001
6/30/2020	0	0	0	0	865,568	1,497,433	865,568	1,497,433
6/30/2021	0	0	0	0	865,568	631,865	865,568	631,865
6/30/2022	0	0	0	0	631,865	0	631,865	0

Amortization of Deferrals
($ in thousands)

	2014 Investment (Gain)/Loss		2015 Investment (Gain)/Loss		2016 Investment (Gain)/Loss		Total Deferrals	
Fiscal Year End	**Amount Recognized**	**EOY Balance**	**Amount Recognized**	**EOY Balance**	**Amount Recognized**	**EOY Balance**	**Amount Recognized**	**EOY Balance**
6/30/2015	$(142,985)	$(571,942)	$0	$0	$0	$0	$(142,985)	$571,942
6/30/2016	(142,985)	(428,957)	107,890	431,559	0	0	(35,095)	2,602
6/30/2017	(142,985)	(285,972)	107,890	323,669	170,598	682,392	135,503	720,089
6/30/2018	(142,985)	(142,987)	107,890	215,779	170,598	511,794	135,503	584,586
6/30/2019	(142,987)	0	107,890	107,889	170,598	341,196	135,501	449,085
6/30/2020	0	0	107,889	0	170,598	170,598	278,487	170,598
6/30/2021	0	0	0	0	170,598	0	170,598	0
6/30/2022	0	0	0	0	0	0	0	0

SECTION IV – PENSION EXPENSE

As noted earlier, the Pension Expense (PE) consists of a number of different items. GASB 68 refers to the first as Service Cost which is the Normal Cost using the Entry Age Normal (EAN) actuarial funding method. The second item is interest on the beginning of year TPL and the cash flows during the year at the SEIR in effect as of the previous measurement date.

The next three items refer to any changes that occurred in the TPL due to:

- benefit changes,
- actual versus expected experience or
- changes in actuarial assumptions.

Benefit changes, which are reflected immediately in PE, can be positive, if there is a benefit improvement for existing Plan members, or negative if there is a benefit reduction. For the year ended June 30, 2016 there were no benefit changes to be recognized.

The next item to be recognized is the portion of current year changes in TPL due to actual versus expected experience for the year. The portion to recognize in the current year is determined by spreading the total change over the average expected remaining service life of the entire Plan membership. The remaining service life of active members is the average number of years they are expected to remain active. For the year ended June 30, 2016 this number is 11.14. The remaining service life of the inactive members is, of course, zero. Therefore, the figure to use for the amortization is the weighted average of these two amounts, or 5.73. The table below provides the calculation of the average remaining future service life.

Category	Number (1)	Average Years of Future Service Life (2)
a. Active Members	49,976	11.14
b. Inactive Members	47,260	0.00
c. Total	97,236	
Weighted Average Years of Future Service Life [(a1 x a2) + (b1 x b2)]/c1		5.73

The last item under changes in TPL are changes in actuarial assumptions. Since the prior measurement date, rates of withdrawal, disability retirement, service retirement and mortality were adjusted to more closely reflect actual and anticipated experience. The analysis and basis for these changes are included in the latest Experience Investigation for the five-year period ending June 30, 2015. In addition, economic assumptions (assumed rates of inflation and investment return), the actuarial cost method, and the UAAL amortization methodology were changed in accordance with Memorandum of Agreement (MOU) between the State and SEBAC effective December 8, 2016. Recognition of these changes will be spread over the remaining service life of the entire Plan membership.

Member contributions for the year and projected earnings on the FNP, again at the rate used to calculate the liabilities, are subtracted from the amount determined thus far. The current year portions of previously determined experience, assumption, and investment earnings amounts, recognized as deferred inflows and outflows (see Section IV) are included next. Deferred inflows are subtracted from the PE while deferred outflows are added to the PE. Since this is the first year of implementation of GASB 68, there are no deferred inflows or outflows at the beginning of the year. Finally, administrative expenses and other miscellaneous items are included.

The calculation of the Pension Expense is shown in the following table.

Pension Expense
Determined as of the Measurement Date
($ thousands)

Service Cost	$322,114
Interest	2,105,947
Current-period benefit changes	0
Expensed portion of current-period difference between expected and actual experience in the total pension liability	134,862
Expensed portion of current-period changes of assumptions	865,568
Member contributions	(135,029)
Projected earnings on plan investments	(852,890)
Expensed portion of current-period differences between actual and projected earnings on plan investments	170,598
Administrative expense	651
Other*	(85,608)
Recognition of beginning deferred outflows of resources as pension expense	0
Recognition of beginning deferred inflows of resources as pension expense	(35,095)
Pension Expense	$2,491,118

* Includes $75,550 adjustment to beginning of year net position.

SECTION V – REQUIRED SUPPLEMENTARY INFORMATION

There are several tables of Required Supplementary Information (RSI) that need to be included in the System's financial statements.

Paragraph 46: The required tables are provided in Schedule A.

Paragraph 47: In addition the following should be noted regarding the RSI:

Changes of benefit terms:

- 2014
  - The 2011 SEBAC Agreement changed the benefit multiplier for the portion of benefit below the breakpoint from 1.33% to 1.40%. This change was made effective for all active members who retire on or after July 1, 2013 in Tier II, IIA and III.
  - A one-time decision was granted to members not eligible to retire by July 1, 2022 to elect to maintain the same normal retirement eligibility applicable to members eligible to retire before July 1, 2022. Employees who elected by July 1, 2013 to maintain the eligibility are required to make additional employee contributions for the length of their remaining active service with SERS. The additional contribution was up to 0.72% of pensionable earnings.

Changes of assumptions:

- 2016
  - Rates of withdrawal, disability retirement, service retirement and mortality were adjusted to more closely reflect actual and anticipated experience. The analysis and basis for these changes are included in the latest Experience Investigation for the five-year period ending June 30, 2015.
  - Economic assumptions (assumed rates of inflation and investment return), the actuarial cost method, and the UAAL amortization methodology were changed in accordance with Memorandum of Agreement (MOU) between the State and SEBAC effective December 8, 2016.

Method and assumptions used in calculations of actuarially determined contributions. The actuarially determined contributions in the schedule of employer contributions are calculated as of June 30 each biennium for the fiscal years ending two and three years after the valuation date (June 30, 2016 employer contributions based on June 30, 2014 valuation). The following actuarial methods and assumptions were used to determine the most recent contributions reported in that schedule:

Actuarial cost method	Projected Unit Credit
Amortization method	Level percent of pay, closed
Single equivalent amortization period	17 years
Asset valuation method	5-year smoothed market
Inflation	3.75 percent
Salary increase	4.00-20.00 percent, including inflation
Investment rate of return	8.00 percent, net of investment related expense

SCHEDULE A

REQUIRED SUPPLEMENTARY INFORMATION

SCHEDULE OF CHANGES IN THE NET PENSION LIABILITY
($ in Thousands)

Fiscal Year Ending June 30	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total pension liability										
Service Cost	$ 287,473	$ 310,472	$ 322,114							
Interest	1,998,736	2,052,651	2,105,947							
Benefit changes	0	0	0							
Difference between expected and actual experience	0	0	772,762							
Changes of assumptions	0	0	4,959,705							
Benefit payments	(1,563,029)	(1,650,465)	(1,729,181)							
Refunds of contributions	(3,935)	(7,124)	(7,098)							
Net change in total pension liability	719,245	705,534	6,424,249							
Total pension liability - beginning	25,767,688	26,486,933	27,192,467							
Total pension liability - ending (a)	$26,486,933	$27,192,467	$33,616,716							
Plan net position										
Contributions - employer	$ 1,268,890	$ 1,371,651	$ 1,501,805							
Contributions - member	144,807	187,339	135,029							
Net investment income	1,443,391	294,412	(100)							
Benefit payments	(1,563,029)	(1,650,465)	(1,729,181)							
Administrative expense	0	0	(651)							
Refunds of contributions	(3,935)	(7,124)	(7,098)							
Other	0	0	85,608*							
Net change in plan net position	1,290,124	195,813	(14,588)							
Plan net position - beginning	9,182,443	10,472,567	10,668,380							
Plan net position - ending (b)	$10,472,567	$10,668,380	$10,653,792							
Net pension liability - ending (a) - (b)	$16,014,366	$16,524,087	$22,962,924							

* Includes $75,550 adjustment to beginning of year net position.

SCHEDULE OF THE NET PENSION LIABILITY
($ in Thousands)

Fiscal Year Ending June 30	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Total pension liability	$ 26,486,933	$ 27,192,467	$33,616,716							
Plan net position	10,472,567	10,668,380	10,653,792							
Net pension liability	$ 16,014,366	$ 16,524,087	$22,962,924							
Ratio of plan net position to total pension liability	39.54%	39.23%	31.69%							
Covered payroll	$ 3,487,577	$ 3,618,361	$ 3,720,751							
Net pension liability as a percentage of covered payroll	459.18%	456.67%	617.16%							

* Covered payroll equals the total active annual compensation from each year's valuation report.

SCHEDULE OF EMPLOYER CONTRIBUTIONS
($ in Thousands)

Fiscal Year Ending June 30	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007
Actuarially determined employer contribution	$1,514,467	$1,379,189	$1,268,935	$1,059,652	$ 926,372	$ 944,077	$ 897,428			
Actual employer contributions	1,501,805	1,371,651	1,268,890	1,058,113	926,343	825,801	720,527			
Annual contribution deficiency (excess)	$ 12,662	$ 7,538	$ 45	$ 1,539	$ 29	$ 118,276	$ 176,901			
Covered payroll*	$3,720,751	$3,618,361	$3,487,577	$3,480,483	$3,354,682	$3,210,666	$3,295,666			
Actual contributions as a percentage of covered payroll	40.36%	37.91%	36.38%	30.40%	27.61%	25.72%	21.86%			

* Covered payroll equals the total active annual compensation from each year's valuation report.

SCHEDULE B

SUMMARY OF BENEFIT PROVISIONS EVALUATED

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.
Hybrid	All Higher Education Employees that are eligible for the Alternative Retirement Plan may elect the Hybrid Plan.

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 C

STATEMENT 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	Men	Women	Age	Men	Women
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: Market Value of Assets.

VALUATION METHOD: Entry Age Normal cost 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%