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**Connecticut State Teachers' Retirement System  
Retiree Health Insurance Plan  
Actuarial Valuation  
as of June 30, 2014**





# Cavanaugh Macdonald

CONSULTING, LLC

*The experience and dedication you deserve*

October 21, 2014

Board of Directors

Connecticut State Teachers' Retirement System

765 Asylum Avenue

Hartford, CT 06105

Members of the Board:

The laws governing the operation of the Connecticut State Teachers' Retirement System (the System) provide that actuarial valuations of the assets and liabilities of the System shall be made at least once every two years. We have conducted the actuarial valuation of the System's retiree health insurance benefits (the Plan) as of June 30, 2014 and the results of the valuation are contained in the following report.

In performing the valuation, we relied on data supplied by the System and performed limited tests on the data for consistency and reasonableness. The valuation was prepared based upon our understanding of Chapter 167a, Section 10-183t of the Connecticut General Statutes and the Plan's provisions provided by the System's staff.

The normal cost and accrued liability of the System are developed using the entry age normal cost method. Under this method, the normal cost is the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The cost of providing the Plan's benefits is financed on a pay-as-you-go basis as follows: active teachers pay for the Plan's costs through a contribution of 1.25% of their annual salaries (less \$500,000); retired teachers pay, through monthly premiums, for one third of the basic costs for the Connecticut State Teachers' Retirement Board (CTRB) Sponsored Medicare Supplemental Plans; and the State of Connecticut (the State) pays for one third of the Plan's costs through an annual appropriation in the General Fund. Additionally, the administrative costs of the Plan are financed by the State.

The liabilities and information for the purpose of complying with Governmental Accounting Standards Board Statements No. 43 and No. 45 presented in this report represent the State's portion of the cost of providing the Plan's benefits. Based upon our interpretation of Chapter 167a, Section 10-183t(d) of the Connecticut statutes, it is assumed the State will pay for any long-term shortfall arising from insufficient active member contributions.

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In determining the System's liabilities, future events, such as investment returns, salary increases, deaths, retirements, etc., are anticipated based upon the set of actuarial assumptions as approved by the Board. Since the previous valuation, the assumptions have been revised to reflect the recent experience of the Plan and reflect the Plan's January 1, 2015 transition to prescription drug benefits provided through a Medicare Prescription Drug Plan (PDP). As the Plan will no longer participate in the Centers for Medicare & Medicaid Services' (CMS) Retiree Drug Subsidy Program, the Medicare Part D subsidies implicit in the lower costs for PDPs are recognized in the liability under GASB Statements No. 43 and No. 45.

The assumptions recommended by the actuary are in the aggregate reasonable related to the experience under the Plan and to reasonable expectations of anticipated experience under the Plan and meet the parameters for the disclosures under GASB Statements No. 43 and No. 45. Since the previous valuation, the assumed initial per capita health care costs, the assumed rates of health care inflation used to project the per capita costs, and the participation assumptions have been revised.

This is to certify that the independent consulting actuaries are members of the American Academy of Actuaries and meet the qualification standards of the American Academy of Actuaries to render the actuarial opinion contained herein, 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 Plan and on actuarial assumptions that are internally consistent and reasonably based on the actual experience of the Plan.

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 annual actuarial valuation, an analysis of the range of results is not presented herein. In our opinion, if the required contributions to a qualifying trust are made by the employer from year to year in the future at the levels required on the basis of the successive actuarial valuations, the Plan will operate in an actuarially sound manner.

Respectfully submitted,

A handwritten signature in blue ink, appearing to read 'Eric H. Gary'.

Eric H. Gary, FSA, FCA, MAAA  
Chief Health Actuary

A handwritten signature in blue ink, appearing to read 'Brian C. Nichols'.

Brian C. Nichols, EA, FCA, MAAA  
Senior Actuary



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## Section I: Board Summary

The table below summarizes the results of the June 30, 2014 actuarial valuation as compared with the prior valuation.

<b>Table I-1: Comparative Summary of Principal Results</b>		
	<b>June 30, 2012</b>	<b>June 30, 2014</b>
<b>Membership</b>		
Active Members		
Number	49,808	51,433
Annual Payroll	\$3,652,518	\$3,831,624
Retirees and Beneficiaries		
Number of Retirees Receiving Health Insurance Benefits	24,107	25,407
Number of Spouses Receiving Health Insurance Benefits	11,108	11,648
Inactive Members		
Vested	1,609	1,480
<b>Assets</b>		
Market Value	\$0	\$0
<b>Actuarial Information</b>		
Unfunded Actuarial Liability (UAL)	\$3,048,307	\$2,433,036
Funded Ratio	0.00%	0.00%
Amortization Period	30 years	30 years
<b>Computed Contribution Rates</b>		
Normal Cost	2.72%	2.04%
Unfunded Accrued Liability	<u>3.10%</u>	<u>2.36%</u>
Total	5.82%	4.40%
Member	<u>1.24%</u>	<u>1.24%</u>
State	4.58%	3.16%
<b>State Contribution Amount for Fiscal Year Ending</b>		
June 30, 2013	\$180,460	
June 30, 2014	\$187,227	
June 30, 2015		\$125,620
June 30, 2016		\$130,331
<i>All dollar amounts are in thousands</i>		



## Section I: Board Summary

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### Summary of Key Findings

This report provides the annual expense required to be recognized by the State for purposes of complying with the accounting disclosure requirements of the Governmental Accounting Standards Board Statements No. 43 and No. 45.

The actuarially determined employer normal cost contribution rate decreased from 1.48% as of June 30, 2012 to 0.80% as of June 30, 2014. The unfunded actuarial accrued liability decreased from \$3.048 billion to \$2.433 billion over the two year period. The unfunded actuarial accrued liability rate decreased from 3.10% to 2.36%. We note the following key findings:

- The assumed per capita cost of basic benefits provided by the CTRB Sponsored Medicare Supplemental Plans has decreased by 22% since the prior valuation.
- The valuation reflects the Plan's January 1, 2015 transition to prescription drug benefits provided through a Medicare Prescription Drug Plan (PDP). As the Plan will no longer participate in the Centers for Medicare & Medicaid Services' (CMS) Retiree Drug Subsidy Program, the Medicare Part D subsidies implicit in the lower costs for PDPs are recognized in the liability under GASB Statements No. 43 and No. 45.
- The number of retired members, spouses of retired members, and surviving spouses of retired members currently participating in the CTRB Sponsored Medicare Supplemental Plans has increased by 16% since the prior valuation.
- The assumed participation rates for the Subsidized Local School District Coverage and the CTRB Sponsored Medicare Supplemental Plans for both future retirees and current pre-65 retirees have been revised based on recent plan experience.

Section II of the report provides summarized information on the membership data used in the valuation. Section III of the report covers the Plan's assets and Section IV of the report covers the Plan's liabilities. The results of the valuation are provided in Section V of the report and the accounting information is in Section VI. The appendices provide additional information on: A) the Plan members; B) the actuarial assumptions and methods; and C) the summary of Plan provisions. It should be noted that all information contained in this report for periods prior to June 30, 2010 was produced by a prior actuarial consulting firm.



## Section II: Membership Data

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Data regarding the membership of the Plan for use in the valuation were furnished by the System. The following table summarizes the membership data as of June 30, 2014 and is compared with that reported for the prior valuation.

<b>Table II-1: Summary of Membership Data</b>		
	<b>June 30, 2012</b>	<b>June 30, 2014</b>
<b>Active Members</b>		
Total Number of Active Members	49,808	51,433
Total Annual Compensation	\$3,652,518	\$3,831,624
<b>Retirees and Beneficiaries</b>		
Number of Retirees Receiving Health Insurance Benefits	24,107	25,407
Number of Spouses Receiving Health Insurance Benefits	11,108	11,648
<b>Inactive Members</b>		
Number of Vested Inactive Members	1,609	1,480

*All dollar amounts are in thousands*



### **Section III: System Assets**

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GASB Statements No. 43 and No. 45 define plan assets as resources, usually in the form of stocks, bonds, and other classes of investments, that have been segregated and restricted in a trust, or equivalent arrangement, in which (a) employer contributions to the plan are irrevocable, (b) assets are dedicated to providing benefits to retirees and their beneficiaries, and (c) assets are legally protected from creditors of the employers or plan administrator, for the payment of benefits in accordance with the terms of the plan.

As of June 30, 2014, no assets are held in a qualified trust solely to provide benefits to retirees and their beneficiaries in accordance with the terms of the Plan.



## Section IV: System Liabilities

The present value of benefits is the value, as of the valuation date, of all future benefits expected to be paid to current members of the Plan. An actuarial cost method allocates each individual's present value of benefits to past and future years of service. The actuarial accrued liability includes the portion of the active member present value of benefits allocated to past service as well as the entire present value of benefits for retirees, beneficiaries and inactive members. The unfunded actuarial accrued liability (UAAL) is the difference between the actuarial accrued liability and the actuarial value of assets. Table IV-1 shows the allocation of the present value of future benefits into components for future normal cost contributions and actuarial accrued liabilities and the determination of the UAAL as of the valuation date.

<b>Table IV-1: Calculation and Allocation of Present Value of Future Benefits</b>			
	<b>Entry Age Actuarial Cost Method</b>		
	<b>(1) Present Value of Future Benefits</b>	<b>(2) Portion Covered By Future Normal Cost Contributions</b>	<b>(3) Actuarial Accrued Liabilities (1) - (2)</b>
<b>Active Members</b>			
Service Retirement	\$1,900,348	\$ 885,390	\$1,014,958
Disability Retirement	27,279	24,613	2,666
Survivors' Benefits	28,781	19,212	9,569
Termination	189,159	164,147	25,012
Total for Active Members	2,145,567	1,093,362	1,052,205
<b>Inactive Members</b>	69,509	0	69,509
<b>Retirees and Beneficiaries</b>	1,311,322	0	1,311,322
<b>Total</b>	<b>\$3,526,398</b>	<b>\$1,093,362</b>	<b>\$2,433,036</b>
<b>Actuarial Value of Assets</b>			\$0
<b>Unfunded Actuarial Accrued Liability</b>			\$2,433,036
<b>Funded Ratio</b>			0.00%
<i>All dollar amounts are in thousands</i>			

The valuation shows the Plan has an actuarial accrued liability of \$1,052,205,000 for benefits expected to be paid on account of the present active membership, based on service to the valuation date. The liability for retiree health insurance benefits payable to inactive members with vested pension benefits is \$69,509,000. The liability on account of benefits payable to retirees amounts to \$1,311,322,000. The total actuarial accrued liability of the Plan amounts to \$2,433,036,000. Against these liabilities, the Plan has present assets for valuation purposes of \$0. Therefore, the unfunded actuarial accrued liability is equal to \$2,433,036,000.



## Section V: Actuarial Valuations Results

Section IV of this report presented the Plan's total present value of future benefits allocated between the present value of future normal cost contributions and actuarial accrued liability. The portion of the active members' present value of benefits allocated to future years of service is funded through annual normal cost contributions determined by the entry age normal actuarial cost method. Under the entry age normal actuarial cost method, the Plan's annual normal cost rate is calculated as a percent of covered payroll, which is expected to remain level over all future years of service. The portion of the total normal cost rate in excess of the active member contribution rate is the State's normal cost rate. The normal cost rate developed as of the valuation date is presented in Table V-1. Table V-1 also shows the State's contribution rate that is necessary to amortize, as a level percent of active member payroll, the UAAL over a period of thirty years.

Table V-1: State Contribution Rate	
Normal Cost Rate of Active Members by Expected Benefit Type	
Service Retirement	1.67%
Termination	0.28%
Disability Retirement	0.05%
Survivors' Benefits	0.04%
Total Normal Cost Rate for Active Members	2.04%
Less: Active Member Contribution Rate	1.24%
State Normal Cost Rate	-
State Normal Cost Rate	0.80%
Unfunded Actuarial Accrued Liability	2.36%
<b>State Contribution Rate</b>	<b>3.16%</b>



## Section VI: Accounting Information

- Governmental Accounting Standards Board Statements No. 43 and No. 45 set forth certain items of required supplementary information to be disclosed in the financial statements of the Plan and the State. One such item is the schedule of funding progress, as shown below.

Table VI-1: Schedule of Funding Progress						
Actuarial Valuation as of June 30	Actuarial Value of Assets (a)	Actuarial Accrued Liability (AAL) (b)	Unfunded AAL (UAAL) (b) - (a)	Funded Ratio (a) / (b)	Covered Payroll (c)	UAAL as a % of Active Member Payroll [(b) - (a)] / (c)
2008	\$0	\$2,318,841	\$2,318,841	0.0%	\$3,399,305	68.22%
2010	0	2,997,856	2,997,856	0.0%	3,645,974	82.22%
2012	0	3,048,307	3,048,307	0.0%	3,652,518	83.46%
2014	0	2,433,036	2,433,036	0.0%	3,831,624	63.50%

*All dollar amounts are in thousands*

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

- The following shows the schedule of employer contributions.

Table VI-2: Schedule of Employer Contributions			
Fiscal Year Ending June 30	Annual Required Contribution (a)	Actual Contributions (b)	Percent Contributed (b) / (a)
2008*	\$116,123	\$20,770	17.9%
2009*	116,667	22,433	19.2
2010*	121,334	12,108	10.0
2011*	177,063	5,312	3.0
2012*	184,145	49,486	26.9
2013*	180,460	27,040	15.0
2014	187,227	25,955	13.9
2015	125,620	N/A	N/A
2016	130,331	N/A	N/A

*All dollar amounts are in thousands*

\* Historical information as provided in the most recent financial report.



## Section VI: Accounting Information

3. The information presented in the required supplementary schedules was determined as part of the actuarial valuation at June 30, 2014. Additional information as of the latest actuarial valuation follows.

Table VI-3: Additional Information	
Valuation date	June 30, 2014
Actuarial cost method	Entry Age
Amortization method	Level Percent of Pay, Open
Amortization period	30 years
Asset valuation method	Market Value of Assets
Actuarial assumptions:	
Investment rate of return (includes inflation)	4.50%
Projected salary increases (includes inflation)	3.75% - 7.00%
Inflation	3.00%
Claims Trend Assumption	5.75% - 5.00%
Year of Ultimate Trend	2017
Contribution Trend Assumption	5.75% - 5.00%
Year of Ultimate Trend	2017

The assumed investment rate of return reflects the fact no assets are set aside within the System which are legally held exclusively for retiree health insurance benefits. If a qualified trust or equivalent arrangement were set up for this purpose, the investment rate of return may be increased.



## Section VI: Accounting Information

4. The following shows contributions towards the Annual OPEB Cost (AOC)

<b>Table VI-4: Trend Information</b>			
Fiscal Year Ending June 30	Annual OPEB Cost (AOC)	Percentage of AOC Contributed	Net OPEB Obligation (NOO)
2008*	\$116,123	17.9%	\$ 95,353
2009*	113,704	19.7	186,624
2010*	115,321	10.5	289,837
2011*	167,368	3.2	451,893
2012*	165,955	29.8	568,362
2013*	179,620	15.1	720,942
2014	192,851	13.5	887,838

*All dollar amounts are in thousands*

\* Historical information as provided in the most recent financial report.

5. Following is information to assist the System in the calculation of the Annual OPEB Cost (AOC) and the Net OPEB Obligation (NOO) for the fiscal year ending June 30, 2014.

<b>Table VI-5: Annual OPEB Cost and Net OPEB Obligation</b>	
<b>Fiscal Year Ending June 30, 2014</b>	
(a) Employer Annual Required Contribution	\$ 187,227
(b) Valuation Discount Rate	4.50%
(c) Interest on Net OPEB Obligation: (i) * (b)	\$ 32,442
(d) Amortization Factor	26.8830
(e) Adjustment to Annual Required Contribution: (i) / (d)	\$ 26,818
(f) Annual OPEB Cost: (a) + (c) - (e)	\$ 192,851
(g) Employer Contributions for Fiscal Year Ending June 30, 2014	\$ 25,955
(h) Increase in Net OPEB Obligation: (f) - (g)	\$ 166,896
(i) Net OPEB Obligation at beginning of Fiscal Year	\$ 720,942
(j) Net OPEB Obligation at end of Fiscal Year: (h) + (i)	\$ 887,838

*All dollar amounts are in thousands*



## Appendix A: Membership Data

Table A-1: Schedule of Active Participant Data as of June 30, 2014									
AGE	Years of Service								Total
	Under 5	5 to 9	10 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 & up	
<b>Under 25</b>	578								578
<b>Avg. Pay</b>	44,590								44,590
<b>25 to 29</b>	4,066	710							4,776
<b>Avg. Pay</b>	48,808	54,573							49,665
<b>30 to 34</b>	2,114	4,260	738	1					7,113
<b>Avg. Pay</b>	52,049	60,300	69,882	83,715					58,845
<b>35 to 39</b>	952	2,172	3,457	480					7,061
<b>Avg. Pay</b>	56,156	65,075	75,140	86,265					70,241
<b>40 to 44</b>	670	1,228	2,305	2,576	218				6,997
<b>Avg. Pay</b>	57,377	67,518	78,420	88,364	94,069				78,640
<b>45 to 49</b>	603	996	1,439	1,805	1,178	247			6,268
<b>Avg. Pay</b>	57,314	67,325	78,260	87,912	93,178	91,363			80,607
<b>50 to 54</b>	439	785	1,221	1,033	758	1,208	248		5,692
<b>Avg. Pay</b>	56,178	66,356	77,349	87,627	90,906	92,147	92,431		81,668
<b>55 to 59</b>	224	563	1,008	1,088	700	996	1,049	381	6,009
<b>Avg. Pay</b>	59,802	68,154	77,973	86,939	91,545	91,083	92,970	97,115	85,585
<b>60 to 64</b>	122	263	639	847	740	812	554	972	4,949
<b>Avg. Pay</b>	71,782	71,833	79,683	85,520	91,168	91,383	92,776	95,043	88,189
<b>65 to 69</b>	20	66	206	246	279	283	226	374	1,700
<b>Avg. Pay</b>	66,151	84,579	85,350	89,682	92,259	93,138	93,815	96,449	91,719
<b>70 &amp; up</b>	4	6	22	41	33	51	46	87	290
<b>Avg. Pay</b>	109,766	79,661	79,108	88,672	99,400	91,283	90,438	100,393	93,527
<b>Total</b>	9,792	11,049	11,035	8,117	3,906	3,597	2,123	1,814	51,433
<b>Avg. Pay</b>	52,011	63,567	76,845	87,599	92,100	91,692	92,892	96,024	74,497

Table A-2: Comparative Summary of Active Data		
	June 30, 2012	June 30, 2014
Average Age	45.2 years	44.7 years
Average Service	13.9 years	13.7 years
Average Pay	\$73,332	\$74,497



## Appendix A: Membership Data

<b>Table A-3: Members Receiving Health Insurance Benefits Under the Plan</b>					
<b>June 30, 2014</b>					
	Retirees		Spouses		Total
	Male	Female	Male	Female	
<b>Subsidized Local School District Coverage</b>					
Ages Under 65	725	2,439	864	781	4,809
Ages 65 and Over	<u>2,236</u>	<u>4,618</u>	<u>1,633</u>	<u>1,365</u>	<u>9,852</u>
Total	2,961	7,057	2,497	2,146	14,661
<b>CTRB Sponsored Medicare Supplemental Plans</b>					
Medical with Prescriptions	1,137	2,199	882	690	4,908
Medical with Prescriptions, Vision & Hearing	<u>4,167</u>	<u>7,886</u>	<u>3,393</u>	<u>2,040</u>	<u>17,486</u>
Total	5,304	10,085	4,275	2,730	22,394
<b>Total</b>	<b>8,265</b>	<b>17,142</b>	<b>6,772</b>	<b>4,876</b>	<b>37,055</b>

<b>Table A-4: CTRB Sponsored Medicare Supplemental Plan Participation by Attained Age</b>							
<b>Retirees and Spouses Combined</b>							
<b>June 30, 2014</b>							
<b>Medical with Prescriptions</b>							
Gender	Attained Age						Total
	Under 65	65 - 69	70 - 74	75 - 79	80 - 84	85+	
Male	4	273	311	305	475	651	2,019
Female	<u>9</u>	<u>388</u>	<u>358</u>	<u>471</u>	<u>700</u>	<u>963</u>	<u>2,889</u>
Total	13	661	669	776	1,175	1,614	4,908
<b>Medical with Prescriptions, Vision &amp; Hearing</b>							
Gender	Attained Age						Total
	Under 65	65 - 69	70 - 74	75 - 79	80 - 84	85+	
Male	22	2,366	2,426	1,381	831	534	7,560
Female	<u>33</u>	<u>3,596</u>	<u>2,962</u>	<u>1,636</u>	<u>912</u>	<u>787</u>	<u>9,926</u>
Total	55	5,962	5,388	3,017	1,743	1,321	17,486
<b>Total</b>							
Gender	Attained Age						Total
	Under 65	65 - 69	70 - 74	75 - 79	80 - 84	85+	
Male	26	2,639	2,737	1,686	1,306	1,185	9,579
Female	<u>42</u>	<u>3,984</u>	<u>3,320</u>	<u>2,107</u>	<u>1,612</u>	<u>1,750</u>	<u>12,815</u>
Total	68	6,623	6,057	3,793	2,918	2,935	22,394



## Appendix B: Summary of Actuarial Assumptions and Methods

### Investment Rate of Return

Assumed annual rate of 4.50% net of investment and administrative expenses.

### Health Care Cost Trend Rates

Following is a chart detailing trend assumptions. Trend is applied to the CTRB Sponsored Medicare Supplemental Plans' premiums and claims.

Year of Increase	Claims Trend	Contributions Trend
2014	5.75%	5.75%
2015	5.50%	5.50%
2016	5.25%	5.25%
2017 and beyond	5.00%	5.00%

No increases are assumed for the Subsidized Local School District Coverage's subsidy of \$110 per month for a retired member, plus an additional \$110 per month for a spouse, as the subsidy amount is set by statute and has not increased since July of 1996. The valuation assumes all future recipients of the subsidy receive an amount of \$110 per month.

### Anticipated Plan Participation

The assumed annual rates of member participation and spouse coverage are as follows:

Participant	Subsidized Local School District Coverage	CTRB Sponsored Medicare Supplemental Plans
Member Pre 65	61%	N/A
Member Post 65	23%	54%
Spouse/Survivor Pre 65*	43%	N/A
Spouse/Survivor Post 65*	30%	40%

\*Percentage of participating members electing spouse coverage.



## Appendix B: Summary of Actuarial Assumptions and Methods

### Age Related Morbidity

Per capita health care costs of the CTRB Sponsored Medicare Supplemental Plans are adjusted to reflect expected cost changes related to age. The increase to the net incurred claims was assumed to be:

Participant Age	Annual Increase
< 30	0.0%
30 – 34	1.0%
35 – 39	1.5%
40 – 44	2.0%
45 – 49	2.6%
50 – 54	3.3%
55 – 59	3.6%
60 – 64	4.2%
65 – 69	3.0%
70 – 74	2.5%
75 – 79	2.0%
80 – 84	1.0%
85 - 89	0.5%
90 and over	0.0%

### Annual Expected Claims of the CTRB Sponsored Medicare Supplemental Plans

Assumed adult per capita health care costs were based on past experience and trended based on the assumptions. The expected value of medical and prescription drug claims of the CTRB Sponsored Medicare Supplemental Plans, age adjusted to age 65, for the year following the valuation date is \$2,502.96. This amount includes medical, drug, and third-party administrative costs, and represents the amount the System pays as the full contribution amount. The average medical, drug, and administrative costs shown are normalized to age 65 and then age adjusted in calculating liabilities.

For the June 30, 2014 valuation, the assumed health care claims costs are based on the premium equivalent rate provided by the System. CMC accepted all information without audit and has relied upon the sources for the accuracy of the data; however, CMC did review the information for reasonableness. On the basis of this review, CMC believes the data and information provided to be sufficiently complete and reliable, and that it is appropriate for the purposes intended.

The valuation reflects the Plan's January 1, 2015 transition to prescription drug benefits provided through a Medicare Prescription Drug Plan (PDP). As the Plan will no longer participate in the Centers for Medicare & Medicaid Services' (CMS) Retiree Drug Subsidy Program, the Medicare Part D subsidies implicit in the lower costs for PDPs are recognized in the liability under GASB Statements No. 43 and No. 45.



## Appendix B: Summary of Actuarial Assumptions and Methods

### Spouse Participation in Health Insurance Coverage

Use of actual census data and current coverage elections for spouses of current retirees. For spouses of future retirees, it was assumed females were three years younger than their spouse.

### Rates of Annual Salary Increase

Rates of Annual Salary Increase Assumption	
<u>Years of Service</u>	<u>Annual Rate</u>
0 – 9	7.00%
10 – 14	5.50%
15 - 19	4.00%
20+	3.75%

### Active Member Decrement Rates

- a. Table below provides a summary of the assumed rates of service retirement.

Annual Rates of Retirement						
Age	Unreduced		Proratable		Reduced	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
50	27.5%	15.0%			2.0%	2.0%
55	38.5%	30.0%			4.5%	6.0%
60	22.0%	20.0%	6.0%	5.4%		
65	36.3%	30.0%	20.0%	13.5%		
70	100.0%	40.0%	35.0%	10.8%		
75	100.0%	40.0%	40.0%	18.0%		
80	100.0%	100.0%	100.0%	100.0%		



## Appendix B: Summary of Actuarial Assumptions and Methods

- b. Table below provides a summary of the assumed rates of mortality while actively employed and disability.

Annual Rates of Death and Disability				
Age	Pre-Retirement Mortality		Disability	
	Male	Female	Male	Female
20	0.0164%	0.0108%	0.0455%	0.0500%
25	0.0210%	0.0109%	0.0455%	0.0500%
30	0.0268%	0.0140%	0.0455%	0.0410%
35	0.0431%	0.0249%	0.0455%	0.0410%
40	0.0645%	0.0343%	0.0715%	0.0720%
45	0.0790%	0.0527%	0.1625%	0.1200%
50	0.1027%	0.0761%	0.3250%	0.2630%
55	0.1490%	0.1316%	0.7150%	0.4380%
60	0.2911%	0.2675%	1.2805%	0.5000%
64	0.4928%	0.4539%	1.2805%	0.5000%

- c. Table below provides a summary of the assumed rates of withdrawal for active members prior to eligibility for retirement.

Annual Rates of Withdrawal					
10 or more years of service					
Years of Service	Male	Female	Age	Male	Female
0-1	14.00%	12.00%	25	1.20%	3.50%
1-2	8.50%	9.00%	30	1.20%	3.50%
2-3	5.50%	7.00%	35	1.20%	3.50%
3-4	4.50%	6.00%	40	1.20%	2.30%
4-5	3.50%	5.50%	45	1.26%	1.30%
5-6	2.50%	5.00%	50	1.96%	1.25%
6-7	2.40%	4.50%	55	2.76%	1.60%
7-8	2.30%	3.50%	59	3.00%	1.90%
8-9	2.20%	3.00%			
9-10	2.10%	2.50%			

### Withdrawal Assumptions

It was assumed that 30% of the vested members who terminate elect to withdraw their contributions while the remaining 70% elect to leave their contributions in the plan in order to be eligible for a benefit at their retirement date. It is assumed that eligible deferred vested participants will commence health care benefits at age 60.



## Appendix B: Summary of Actuarial Assumptions and Methods

### Post-Retirement Mortality

For healthy retirees and beneficiaries, the RP-2000 Combined Mortality Table projected forward 19 years using scale AA, with a two-year setback for males and females. A separate table of mortality rates is used for disabled retirees. The following are sample rates for the retirees and beneficiaries:

Annual Rates of Death				
Age	Healthy		Disabled	
	Male	Female	Male	Female
50	0.1369%	0.1015%	0.3881%	0.3567%
55	0.1986%	0.1755%	0.7659%	0.6953%
60	0.3881%	0.3567%	1.3671%	1.2224%
65	0.7659%	0.6953%	2.2802%	2.0100%
70	1.3671%	1.2224%	4.1439%	3.2898%
75	2.2802%	2.0100%	7.7020%	5.4696%
80	4.1439%	3.2898%	13.6910%	9.9435%
85	7.7020%	5.4696%	22.0697%	16.4072%

### Marriage Assumption

For the purpose of valuing coverage under the in-service death benefit, 85% of males and 75% of females assumed to be married, with females being three years younger than their spouse.

### Asset Valuation Method

The Plan is financed on a pay-as-you-go basis, and no methodology is needed to determine the actuarial value of assets.

### Actuarial Cost Method

The Entry Age Normal actuarial cost method allocates the plan's actuarial present value of future benefits to various periods based upon service. The portion of the present value of future benefits allocated to years of service prior to the valuation date is the actuarial accrued liability, and the portion allocated to years following the valuation date is the present value of future normal costs. The normal cost is determined for each active member as the level percent of payroll necessary to fully fund the expected benefits to be earned over the career of each individual active member. The normal cost is partially funded with active member contributions with the remainder funded by employer contributions.

The unfunded accrued liability is determined by subtracting the actuarial value of assets from the actuarial accrued liability.

### Administrative and Investment Expenses

The investment return assumption represents the expected return net of all administrative and investment expenses.



## **Appendix B: Summary of Actuarial Assumptions and Methods**

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### **Payroll Growth Rate**

The total annual payroll of active members is assumed to increase at an annual rate of 3.75%. This rate does not anticipate increases in the number of members.

### **Changes from Prior Valuation**

Since the previous valuation, the assumed initial per capita health care costs, the assumed rates of health care inflation used to project the per capita costs, and the participation assumptions have been revised.

### **Affordable Care Act (ACA)**

The impact of the Affordable Care Act (ACA) was addressed in this valuation. Review of the information currently available did not identify any specific provisions of the ACA that are anticipated to significantly impact results. While the impact of certain provisions such as the excise tax on high-value health insurance plans beginning in 2018 (if applicable), mandated benefits and participation changes due to the individual mandate should be recognized in the determination of liabilities, overall future plan costs and the resulting liabilities are driven by amounts employers and retirees can afford (i.e., trend). The trend assumption forecasts the anticipated increase to initial per capita costs, taking into account health care cost inflation, increases in benefit utilization, plan changes, government-mandated benefits, and technological advances. Given the uncertainty regarding the ACA's implementation (e.g., the impact of excise tax on high-value health insurance plans, changes in participation resulting from the implementation of state-based health insurance exchanges), continued monitoring of the ACA's impact on the Plan's liability will be required.



## **Appendix C: Summary of Plan Provisions**

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

### **Covered Employees**

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

### **Credited Service**

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

### **Normal Retirement**

Eligibility - Age 60 with 20 years of Credited Service in Connecticut, or 35 years of Credited Service including at least 25 years of service in Connecticut.

### **Early Retirement**

Eligibility - 25 years of Credited Service including 20 years of Connecticut service, or age 55 with 20 years of Credited Service including 15 years of Connecticut service.

### **Proratable Retirement**

Eligibility - Age 60 with 10 years of Credited Service.

### **Disability Retirement**

Eligibility - 5 years of Credited Service in Connecticut if not incurred in the performance of duty and no service requirement if incurred in the performance of duty.

### **Termination of Employment**

Eligibility - 10 or more years of Credited Service.

### **Teachers' Required Contribution**

1.25% of annual salaries in excess of \$500,000 is contributed for health insurance of retired teachers.

### **State Contribution**

The State pays for one third of the costs through an annual appropriation in the General Fund. Administrative costs of the Plan are financed by the State. Based upon Chapter 167a, Subsection D of Section 10-183t of the Connecticut statutes, it is assumed the State will pay for any long-term shortfall arising from insufficient active member contributions.



## Appendix C: Summary of Plan Provisions

### Retiree Health Care Coverage

Any member that is currently receiving a retirement or disability benefit is eligible to participate in the Plan. There are two types of the health care benefits offered through the system. Subsidized Local School District Coverage provides a subsidy paid to members still receiving coverage through their former employer and the CTRB Sponsored Medicare Supplemental Plans provide coverage for those participating in Medicare, but not receiving Subsidized Local School District Coverage.

Any member that is not currently participating in Medicare Parts A & B is eligible to continue health care coverage with their former employer. A subsidy of up to \$110 per month for a retired member plus an additional \$110 per month for a spouse enrolled in a local school district plan is provided to the school district to first offset the retiree's share of the cost of coverage, any remaining portion is used to offset the district's cost. The subsidy amount is set by statute, and has not increased since July of 1996. A subsidy amount of \$220 per month may be paid for a retired member, spouse or the surviving spouse of a member who has attained the normal retirement age to participate in Medicare, is not eligible for Part A of Medicare without cost, and contributes at least \$220 per month towards coverage under a local school district plan.

Any member that is currently participating in Medicare Parts A & B is eligible to either continue health care coverage with their former employer, if offered, or enroll in the plan sponsored by the System. If they elect to remain in the plan with their former employer, the same subsidies as above will be paid to offset the cost of coverage.

If a member participating in Medicare Parts A & B so elects, they may enroll in one of the CTRB Sponsored Medicare Supplemental Plans. Active members, retirees, and the State pay equally toward the cost of the basic coverage (medical and prescription drug benefits). There are three choices for coverage under the CTRB Sponsored Medicare Supplemental Plans. The choices and calendar year premiums charged for each choice are shown in the table below:

Monthly Funding Rates for CTRB Sponsored Medicare Supplemental Plans						
Coverage	2010	2011	2012	2013	2014	2015
Medicare Supplement with Prescriptions	\$112	\$125	\$124	\$117	\$97	\$91
Medicare Supplement with Prescriptions and Dental	\$160	\$174	\$173	\$160	\$141	\$136
Medicare Supplement with Prescriptions, Dental, Vision & Hearing	\$165	\$179	\$180	\$165	\$146	\$140

Those participants electing vision, hearing, and/or dental are required by the System's funding policy to pay the full cost of coverage for these benefits, and no liability under GASB No. 43 and No. 45 is assumed by the Plan for these benefits.

### Survivor Health Care Coverage

Survivors of former employees or retirees remain eligible to participate in the Plan and continue to be eligible to receive either the \$110 monthly subsidy or participate in the CTRB Sponsored Medicare Supplemental Plans, as long as they do not remarry.



## Appendix D: Glossary

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

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

**Actuarial Assumptions** - Estimates of future plan experience with respect to rates of mortality, disability, turnover, retirement, rate or rates of investment income and salary increases. Decrement assumptions (rates of mortality, disability, turnover and retirement) are generally based on past experience, often modified for projected changes in conditions. Economic assumptions (salary increases and investment income) consist of an underlying rate in an inflation-free environment plus a provision for a long-term average rate of inflation.

**Actuarial Cost Method** - A mathematical budgeting procedure for allocating the dollar amount of the "actuarial present value of future plan benefits" between the actuarial present value of future normal costs and the actuarial accrued liability. Sometimes referred to as the "actuarial funding method".

**Actuarial Equivalent** - A series of payments is called an actuarial equivalent of another series of payments if the two series have the same actuarial present value.

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

**Age-Related Morbidity** - Assumed increase to the net incurred claims related to the increase in age.

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

**Annual OPEB Cost (AOC)** - An accrual-basis measure of the periodic cost of an employer's participation in a defined benefit OPEB plan.

**Annual Required Contributions of the Employer (ARC)** - The employer's periodic required contributions to a Defined Benefit OPEB Plan, which is the basis for determining an employer's Annual OPEB Cost.

**Entry Age Normal Actuarial Cost Method** - A method under which the Actuarial Present Value of the Projected Benefits of each individual included in an Actuarial Valuation is allocated on a level basis over the earnings or service of the individual between entry age and assumed exit age(s). The portion of this Actuarial Present Value allocated to a valuation year is called the Normal Cost. The portion of this Actuarial Present Value not provided for at a valuation date by the Actuarial Present Value of future Normal Costs is called the Actuarial Accrued Liability.

**Experience Gain (Loss)** - A measure of the difference between actual experience and that expected based upon a set of actuarial assumptions during the period between two actuarial valuation dates, in accordance with the actuarial cost method being used.

**Health Care Cost Trend Rates** - The annual assumed rate of increase for both claims and contributions.

**Implicit Rate Subsidy** - The differential between utilizing a blend of active and non-Medicare retiree experience for cost of benefits, and utilizing solely the expected retiree experience. Blending a lower cost active cohort with retirees results in an implicit rate subsidy for the retirees of the entire group.



## Appendix D: Glossary

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**Level Dollar Amortization Method** - The dollar amount to be amortized is divided into equal dollar amounts to be paid over a given number of years; part of each payment is interest and part is principal (similar to a mortgage payment on a building). Because payroll can be expected to increase as a result of inflation, level dollar payments generally represent a decreasing percentage of payroll; in dollars adjusted for inflation, the payments can be expected to decrease over time.

**Level Percentage of Projected Payroll Amortization Method** - Amortization payments are calculated so that they are a constant percentage of the projected payroll of active plan members over a given number of years. The dollar amount of the payments generally will increase over time as payroll increases (e.g., due to inflation); in dollars adjusted for inflation, the payments can be expected to remain level.

**Net OPEB Obligation (NOO)** - The cumulative difference since the effective date of this Statement between Annual OPEB Cost and the employer's contributions to the plan, including the OPEB liability (asset) at transition, if any, and excluding (a) short-term differences and (b) unpaid contributions that have been converted to OPEB-related debt.

**Normal Cost** - The annual cost assigned, under the actuarial funding method, to current and subsequent plan years. Sometimes referred to as "current service cost". Any payment toward the unfunded actuarial accrued liability is not part of the normal cost.

**Other Postemployment Benefits (OPEB)** - Postemployment benefits other than pension benefits. Other postemployment benefits (OPEB) include postemployment healthcare benefits, regardless of the type of plan that provides them, and all postemployment benefits provided separately from a pension plan, excluding benefits defined as termination offers and benefits.

**Pay-As-You-Go** - A method of financing a plan under which the contributions to the plan are generally made at about the same time and in about the same amount as benefit payments and expenses becoming due.

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

**Sponsor** - The entity that established the plan. The sponsor generally is the employer or one of the employers that participate in the plan to provide benefits for their employees and employees of other employers.

**Substantive Plan** - The terms of an OPEB plan as understood by the employer(s) and plan members.

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

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